A DYNAMIC SYSTEMS ANALYSIS
OF DEFENSIVE MEDICINE

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ABSTRACT

Dynamic systems analysis is a modeling technique used to identify and clarify complex interrelations. It grew out of industrial dynamics and has previously been applied to elucidate complex social issues, e.g., urban dynamics and world dynamics.

Defensive medicine entails activities undertaken by the physician designed to protect him from liability and not primarily intended to benefit the sick patient. The increasing cost of health care requires that attention be paid to improved efficiency in patient management.

Thus, if defensive medicine were shown to consume significant resources allocated to patient care it may be useful to understand the system in which it operates as a prerequisite to further research and intervention designed to improve the efficiency of patient management.

Based upon a series of interviews with physicians, lawyers, and insurance company representatives and by access to the preliminary data generated by the Secretary of Health, Education and Welfare's Commission on Medical Malpractice, we have developed a model of the system in which we find defensive medicine practiced. One attribute of the system (i.e., the defensive use of diagnostic x-rays) was studied in some detail because of our interest and because it was here where we found the most available data. The data base was broadened to include the legal-medical malpractice literature, and this information also provided an arena for more detailed analysis. The model was then tested for feasibility and confirmation by presentation to six medical groups encompassing approximately 670 physicians of a widespread geographical distribution.

Each attribute of the system is defined and discussed in relation to its apparent validity and its interaction with other attributes covered in the model. This approach allowed us to confirm the significance of defensive medicine practice and to identify areas
for further research and ultimate intervention. For example it appears that over 1 billion dollars are being spent each year in the defensive use of diagnostic radiology in response to a legal liability threat of some 65 million dollars. It is just this sort of cost/benefit relationship which becomes clear by using techniques of systems analysis.

Thus, we conclude that:

1. The practice of active defensive medicine contributes significantly to the cost of health care without clear evidence that it benefits patients.

2. The factors which affect the practice of defensive medicine are many and varied, but act in the classic positive feedback mode. That is, the increasing use of defensive medicine results in an ever increasing need to use it.

3. Further research is needed in this field if appropriate strategies for intervention are to be established.

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$1$ Each factor considered in this thesis is identified by an alphabetical designation, e.g., "$A1 \ldots B, C, \ldots Y$" and throughout the thesis the factors as referred to by their alphabetical designations, particularly when discussing the effect of one factor upon another. For example, the effect of $A_4$, Non-Lawyer Advice, upon $A$, Perceived Negative Medical Experience, is referred to as "$A_4 - 4.$$
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CHAPTER I

INTRODUCTION

The health care industry is the most rapidly growing segment of the American economy. The allocation of the Gross National Product for health expenditures increased from 4.6 percent to 7.0 percent between 1950 and 1970. An increasing portion of these health expenditures come from public sources, i.e., up from 19.9 to 35.3 percent over this period. (54)² No other segment of the economy has commanded a greater percentage increase in the allocation of the consumer dollar.

Although the influence of this increased allocation to health care on the quality of life is difficult if not impossible to measure, the measurable parameters of this effective redistribution of resources toward health expenditures suggests that this redistribution has had little if any impact on society. Indeed, the death rate per 1,000 people from 1950 to 1970 is essentially unchanged (i.e., 9.6 versus 9.4)(50). While it seems probable that some of the increase in health care cost is related to an increased availability of service brought on by the impact of such Federal policies as Medicare, this alone does not seem to account for the remarkable redistribution of resources to health care seen over the past twenty years. Indeed, of the 2.4 percent increased allocation of the Gross National Product to health expenditures only .6 percent could reasonably be ascribed to the enactment of Medicare (i.e.,

² Throughout this thesis, the numbers in parentheses refer to the sources listed in the bibliography and the reference, if any, after the number is a reference to a specific page in that source.
the percent increase from years 1965 to 1968 with the associated percent increase in the public expenditures from 20.8 percent to 34.9 percent)(54).

We would not argue that medicine has made remarkable contributions toward erasing many diseases and injuries which were considered hopeless some twenty years ago. However, it does seem that the transition of medicine from the primary care physician of the horse and buggy days to the modern medical center with advanced technologies has resulted in a redistribution of resources allocated to fund medicine which is out of proportion to the actuarial increase in life span. Roger Egbert's argument that the goal of medicine is now appropriately changing from that of "saving lives" to improving the quality of life 3/3/ can perhaps be ascribed as justification for a change in resource distribution not evident in death rate statistics. It however seems equally appropriate to attempt to ascertain other grounds for resource redistribution, and if inappropriate bases can be identified, it would seem most reasonable to study these in some depth in an effort to clarify the issues and suggest alternatives to current trends.

The past twenty years have seen remarkable advances in the understanding of the basic biologic processes which underlie disease. Much of this understanding has been applied to specific problems, as, for example, tuberculosis has been virtually eliminated by drug therapy. Although medicine has come a long way, many tend to forget

3/ Speech by Roger Egbert, Assistant Secretary for Health, Education and Welfare, to the American Association of Medical Colleges, Cincinnati, Ohio, 1969.
the long way it has yet to go. The practice of medicine is still more an art than a science, and this everyday practice involves countless individual judgments by doctors. These advances have a finite cost in addition to the economic increment in that many bring with them new risks with only partial measure of success. No physician can guarantee a successful outcome in every case. Thus, the human side of medicine still prevails. The consumer's increased expectations, combines with the physician's enthusiasm for applying new medical techniques which are poorly understood, leading to an increased susceptibility of inadequate communication between the physician and his patient. In addition an increase in the remoteness of physicians induced by the transition from the earlier days of orientation to the total patient to the current trends of ultraspecialization. This leads to increased social distance, and thus the probability of a conflict between patients and their doctors. These changes in the social style of medical practice are set upon the rapid changes in society and technology so happily described by Toffler (46).

THE PROBLEM

One aspect of increased health care cost, relates to the discord between physician and patient and manifests itself in the format of the medical malpractice claim. In the report of the Secretary of Health Education and Welfare's Commission on Medical Malpractice (hereinafter SCMM) 4/ it was noted that "the fear of being sued

4/ As will be discussed hereinafter, the SCMM was an ad hoc commision which was established to study the malpractice problem by the Secretary of Health, Education and Welfare pursuant to the dictates of President Nixon.
permeates the entire health care community." The consequence is, as testimony before the SCMM and its special studies show, that the problem touches almost every facet of our health care delivery system. Costs, patterns of medical practice and forms of medical treatment, the distribution of health manpower, the relationship between doctors and patients, and even confidence and equal justice before the law—all of these and more are affected by the problem. The direct cost of malpractice has been significant, but is insufficient to account for the tremendous reallocation of resources to health care which result therefrom. Indeed, the index for medical malpractice insurance coverage from 1966 to 1970 increased from 100 to 313.3, while the total medical services price index increased only from 100 to 116.4. (1, p. 31).

The malpractice threat has had other more significant implications on the cost of health care in the practice of defensive medicine. The SCMM describes defensive medicine as "the alteration of modes of medical practice, induced by the threat of liability, for the principle purposes of forestalling the possibility of lawsuits by patients as well as providing defense in the event such lawsuits are instituted." (1, p. 34). While this discussion will emphasize defensive medicine and an analysis of the system under which it is practiced, it would be inappropriate not to also recognize the social implications that the malpractice threat has on the practicing physician and his ability to care for the sick. This was most succinctly summarized in the following statement of a physician to the SCMM: "It may be hard to believe, that we are a frightened profession. The doctor feels put
upon. He feels nude in the corner of the main street of life. He often tries to cover himself with pride, and even occasionally arrogance, only to find himself being castrated. He doesn't really want to believe the hostility he feels. . . The faith of the patient is important to the patient and to his physician. Faith is a power, and the physician continually feels that it is being eroded, but sometimes justified at frequently unjustified attacks." (1, p. 57) While this asocial impact is of considerable importance in maintaining quality health care, it does not lend itself to analysis. Rather, we will attempt to study the economic impact of malpractice and defensive medical practice, using a systems analysis approach.

Dynamic systems analysis is a technique of structured thought which requires identification of causal factors in a temporal relationship allowing for identification of feedback systems both positive and negative. Much has been written on this subject. Historically, the systems dynamics approach was introduced to solve industrial problems and was based on the engineers' concepts of feedback in engineering systems. More recently it has been applied to analyze more complex social systems and has profitably served to identify counter intuitive principles in social systems whereby their elucidation was not apparent by the traditional categorical approach to appreciate the cause and effect relationships in complex system. Thus, systems dynamics does not rely on a taxonomy in classification, but rather depends upon a causal identification of relationships without requisite for their hierarchy.

In essence, defensive medicine represents a component of
health care cost which is not intended by the physician to provide benefit to the patient, but rather to protect the physician from the legal liability. Thus, the physician allocates resources to protect himself which have no clear-cut benefit toward either improving the quality of patients' lives or improving life's quantity. This statement may not be entirely true in that the public has no clear-cut means to control the quality of medical practice, and defensive medicine has been implicated by some as a physician's response to the control mechanism (i.e., the threat of malpractice.) Thus, some have argued that defensive medicine may be desirable because it does demonstrate the physician's concern for the consumer's control mechanism, especially insofar as that concern manifests itself in the physician's utilization of an extra degree of care in his treatment of patients.

However, this argument does not seem to justify a significant allocation of resources toward a goal not designed to help patients. Indeed, we feel that defensive acts designed to benefit patients cannot appropriately be described as defensive medicine. Thus, we will limit our discussion to those activities the physician does in allocating health care resources under the threat of malpractice which do not properly benefit the patient. While many feel this to be an extremely important, if not indeed the most important aspect of the malpractice threat, there has been relatively little study to quantitate it or even to understand its causal factors and implications because of the difficulty in the traditional analytic techniques which have been applied to the problem. Positive defensive medicine has
been defined as increased activities a physician does to ward off the malpractice threat, whereas negative defensive medicines are events the physician refuses to undertake in fear of a later malpractice suit. A third type recognized by the SCMM is that of a physician unwilling to communicate new knowledge obtained in events which potentially could lead to malpractice liability, and thus the failure to communicate this knowledge may be a significant detriment to the dissemination of important medical knowledge. 5/

The problem of attempting to study defensive medicine was early recognized by the SCMM. And although they eagerly sought research projects which would define, examine, and hopefully reveal the extent to which defensive medicine is practiced in the United States, they felt that both the quantity and cost of defensive medicine may not be measurable. But they did conclude that it adds significantly to health care costs.

The frustration with traditional research approaches to this problem led us to the utilization of a systems analysis approach to describe the system in which malpractice induced defensive medicine prevails. It is hoped that through such a descriptive analysis one might be able to quantify some components of the system and the relationships in an effort not only to clarify the system, but to point toward potential research efforts. If the defensive medicine phenomenon is of sufficient magnitude to warrant a serious attack

5/ As explained in the report of the SCMM: "There appears to be a reluctance on the part of some physicians to publish in medical journals, case reports describing in detail any adverse effects from diagnostic and therapeutic procedures. The fear is that the material will be picked up and used as evidence in a lawsuit." (1, p. 35)
thereupon, then we hoped that some of the more sensitive areas for such attack could be appropriately identified.

With this background, we have attempted to devise a descriptive model of the system of medical malpractice with emphasis on defensive medicine and in particular a specific component of positive defensive medicine that is potentially measurable (i.e., the use of the diagnostic x-rays). We will therefore describe our model, its components, and their apparent interactions utilizing a quantitative approach where we have been able to obtain sufficient data.

RESEARCH METHODS

Once we had developed a preliminary model of the system of medical malpractice we sought to gather data through an extensive series of interviews and assimilation of published and unpublished information relevant to the topic. This data then allowed us to justify our preliminary impressions, clarify them, change them, or affect the quantitative appreciation of the relative magnitude of causal factors in their implications.

A primary source of hard data was the final report of the SCMM which was forwarded to the Secretary of Health, Education and Welfare on January 16, 1973. The SCMM was an ad hoc commission established by the Secretary of HEW on June 12, 1971 pursuant to President Nixon's February 1971 health message which directed the Secretary of HEW to "promptly appoint and convene a Commission on Medical Malpractice to undertake an intensive program of research and analysis of the problems associated with malpractice claims against all categories of health care providers
and institutions" (1, p. 5). The Commission's purpose as described in its report to the Secretary was not to "function as a judge or jury seeking to fix blame for the current state of affairs. Its prime objective was to act as a fact-finding body committed to identifying the critical elements of the malpractice problem and recommending possible solutions thereto" (1, p. xxiii).

The principle sources of information which the Commission utilized in arriving at its findings and recommendations were:

1. A series of transcribed public hearings held in Los Angeles, Cincinnati, New Orleans, New York, Denver, and Washington, D.C., at which 212 witnesses representing the medical profession, the legal profession, the insurance industry and the general public testified as to their views, perspectives and suggestions relating to the malpractice problem;

2. Four technical advisory panels created by the Commission to give it advice on health, legal, insurance, and consumer issues with representatives from those interests serving on the panels;

3. The Inter-departmental Committee on Medical Malpractice established by the Secretary, which consisted, in the main, of representatives from the government agencies involved in health care (i.e., Army, Navy, Air Force, Public Health Service, and Veterans' Administration) and whose function was to
enable the Commission to obtain relevant statistics and other information on malpractice claims experienced in the Federal sector; \(^6\)

4. Staff studies and studies generated by a 1.5 million external contract research program (consisting of nine major and seven lesser studies) which sought to quantify as many salient parts of the problem as possible and which was premised on a systems analysis of the four basic communities of interest involved in the problem (medical, legal, insurance and general public); and

5. The deliberations of the members of the Commission. \(^7\)

The staff of the Commission was very cooperative and made available the Commission's Final Report, the staff and contract studies, the transcript of the hearings and all of the memoranda prepared by its advisory panels. \(^8\) Three of the contract studies were especially helpful and since they are referred to frequently throughout this thesis, a brief description of those studies is set forth below:

\(^6\) Hospitals and clinics operated by those agencies provide direct health care service to approximately 11\% of the nation's population (1, xxvi).

\(^7\) The Commission was composed of 21 persons from the four communities referenced above who were appointed by the Secretary of HEW.

\(^8\) A list of the documents which we reviewed in the course of our research, including those furnished by the Commission, is set forth in the appendix.
The Legal Survey was a survey by mail questionnaire and personal interview whose primary target population was all lawyers in private practice in the United States and secondarily a subpopulation of all lawyers who recently (January 1, 1970 through September, 1972) had engaged in medical malpractice cases. Consequently, two different samples of lawyers were surveyed: (1) the National Survey, which was directed to a sampling of 809 lawyers selected at random from the nation's private practice lawyers and is therefore projectible to the entire United States; (2) and the Selective Survey which was directed to a specially compiled list of 409 geographically dispersed lawyers known or believed by the Commission staff to be engaged in medical malpractice litigation. The Legal Survey "was designed to obtain factual information to produce a quantitative picture of the legal system processes which have a direct relationship to the initiation, conduct and outcome of medical malpractice litigation." (4, p. 7)

The Consumer Survey was an interview study of a sample of 1,017 household heads and spouses drawn on an area probability basis to be representative of the national population of households in the continental United States. Its purpose was "to describe the attitudes, level of knowledge, and involvement of the public with the medical malpractice problem" (10, p. i).
The Closed Claims Malpractice Insurance Study (hereinafter referred to as the Closed Claims Survey) was a study by the Commission of a random sampling (approximately 20%) of all malpractice claims files closed by insurance companies in the United States in 1970. A principal goal of that Survey was to ascertain the magnitude of the national medical malpractice problem in terms of the number of incidents resulting in claims and their aggregate settlement cost. It also looked at the outcomes of the cases studied with respect to their stage of disposition, severity of injuries and broke down claims outcomes according to the medical specialties of the insureds.

In addition to our review of the material furnished by the SCMM, we interviewed together or separately some 20 physicians in the practice of medicine with a specific eye toward appreciating the defensive use of radiology (a breakdown of which was not included in the SCMM's report). We also interviewed lawyers and representatives of an insurance company responsible for writing the majority of malpractice insurance. (The list of interviewees is set forth in the bibliography.)

The data obtained from our research was then used to flesh out and clarify our preliminary model. A quantitative approach was used wherever possible.
CHAPTER II

RESULTS

THE GENERAL MODEL

This model (See the Appendix) is the result of our initial impressions considerably supplemented by the available data. We have identified some 41 factors which make up this model, and as described in note 1, page 6, we will discuss each factor in a separate section (e.g., sections A1, . . . B, C, . . . Y) presenting its definition; units of measurement where obtainable; and our evidence for its existence and interaction. In a subsection(s) of each section, we will describe in some detail the implications of that factor upon those other factors which we believe it affects. Those subsections will be labeled with the alphabetic representation of the two factors being discussed in the following manner, "A1 - A2", which refers to the effect of A1, Patient Visit, upon A2, Improper Medical Treatment. A complete outline of the medical malpractice system as discussed in this thesis is set forth in the Appendix. Thus, we will attempt to document our impression that this model is a realistic approximation of the system in which we find defensive medicine. Admittedly some data for the attributes and their linkage is meager and we will attempt to point out the relative merits and validity of each. This data will then lead to a discussion which will revolve around two major segments of this system (the medical and legal implications) in an effort to ascertain the long-term effects of this interrelationship and priorities for intervention if and where appropriate.
FACTORS CONSIDERED:

A1.  PATIENT VISIT

The system obviously starts with a patient visit to a physician. In 1969 there were 840 million physician visits in the United States, or 4.2 visits per resident civilian population (52). Pabst, using another method of estimation concluded that there were approximately 4 million physician visits per day, estimated from the fact that some 250,000 physicians were involved in active patient care each, considered to be seeing approximately 20 patients per day. (29, p. 1) He goes on to state that about 100,000 of the 4 million patients were admitted to 7,000 public and private hospitals each day. This figure is consistent with that obtained from the American Hospital Association Hospital Guide (1969) which estimates a total of 30,729,000 hospital admissions (i.e., 100,000 admissions times 300 days).

IMPLICATIONS OF PATIENT VISIT

(1)  A1 - A2;  (2)  A1 - A3

A patient who visits a physician can obviously receive proper or improper treatment. While there is no data on the incidence of iatrogenic injuries (i.e., physician caused adverse effect of medical treatment) per patient visit, we do have data on the incidence in hospitalized patients. In 1969 approximately 3.7% of patient visits to a physician resulted in hospitalizations (40). In the SCMM study of hospital records from a small number of general hospitals in California, they identified that some 7.6% of patients admitted to hospitals had experienced an iatrogenic negative medical experience (2, p. 4-1). Since most malpractice claims (although we do not know

-22-
the exact percentage) are related to hospital-based incidents, it is reasonable to suggest from the California data that somewhere around one hospital-based instance of improper medical treatment occurs per every 350 patient visits. Although we have no hard data on the incidents of iatrogenic injuries for nonhospitalized patients, the Closed Claims Survey reveals that 25% of the malpractice claims were generated by alleged injuries to such patients (30, p. 4). This percentage cannot be directly applied to the number of physician visits because, as will be discussed hereinafter, there is a tremendous screening process at work in the medical malpractice system which results in the claims filed (ofttimes referred to as "the tip of the iceberg") being a very small percentage of actual improper incidence. Moreover, we assume that most non-hospital injuries probably result in minimal damages. If that be so, then the economic factors discussed in Sections A5 B and A14 B should operate to screen out more of these incidents before the claim filing stage than hospital-based incidents, which more than likely result in more serious injuries.

A2. **IMPROPER MEDICAL TREATMENT**

Improper medical treatment refers to medical care rendered by a physician which is in fact negligent, i.e., the physician failed to perform in accordance with the standards of care recognized and practiced by his peers. This is without regard to whether the patient, or for that matter even the physician, is aware that he breached a duty of care owed to his patient.
A3. **PROPER MEDICAL TREATMENT**

Proper medical treatment obviously is the converse of the improper medical treatment referred to in section A2, i.e., the physician has treated the patient in accordance with the medical standards of his peers. We recognize that since medicine is an art as well as a science, that in looking back on any particular physician-patient treatment situation there is a gray area where experts would disagree as to whether the treatment was proper or improper. But for purposes of this thesis, we have divided all patient care into the two broad categories of proper and improper.

**IMPLICATIONS OF PROPER OR IMPROPER MEDICAL TREATMENT**

(1) A2 - A; (2) A3 - A

A negative medical experience can be perceived from either proper or improper medical treatment. The perception is subjective and thus is not dependent upon the actual existence of something amiss in the patient's medical care. Consequently, a certain percentage of patients who receive proper medical treatment will perceive that something went wrong. Conversely, a certain percentage of patients who in fact received improper medical care will not perceive it. The misperception in the two situations is obviously affected by the patient's rapport with his doctor, his medical awareness and possibly, to a lesser extent, by his knowledge of his legal rights in the doctor-patient relationship. Presumably the greater percentage of patients who perceive that they have had a negative medical experience result from category A2, i.e., those patients who in fact were the victims of improper medical treatment.
A. PERCEIVED NEGATIVE MEDICAL EXPERIENCE

The perceived negative medical experience, which is a sine qua non to the filing of a malpractice claim, is defined as the patient's perception that something went wrong with his medical care. Using the total 1970 population of 204 million people (48, 49), approximately 16.7% of that population, i.e., 34 million people think they have sustained damages in the course of their health care treatment. Most of the damages are perceived to be economic and in half the cases their value is judged to be less than $1,000 (10, p. 41). Data from the Consumer Survey indicates that only 2.7 million of the 34 million will consider doing anything about their perceived damage. The overwhelming majority will not consider seeking legal redress because they perceive 1) the high cost of legal assistance, 2) that they can't beat the system, that is they do not have access to medical records or it will be difficult to impossible to get expert witnesses, 3) there is a significant delay in the legal procedure to gain redress which doesn't make it worth their while, and 4) they do not wish to harm the practitioner (10).

The dominant reason why they do not take action appears to be that

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9/ According to the data in the Consumer Survey, 42.5% of the representative patient sample believed that they or their spouses or dependents had had a negative medical care experience at sometime in their lives. (10, p. 29) There is no data which indicates the percent who perceived a negative medical care experience in 1970. The best data which we have regarding this comes from applying the 16.7% figure from the Consumer Survey for a 12-month period in 1971-72 (10, p. 31). We recognize that to the extent that there are factors in the system which are operating to increase patient perception of negative medical care experiences, the application of the 1971-72 figure to 1969 data might result in a slightly inflated figure for 1970.
they are concerned such actions would harm their physician, with whom they feel they have a good rapport. Thus, as will be discussed, the Consumer Survey revealed that some 42.5% of Americans felt that at sometime either themselves or someone in their immediate family had undergone a negative medical experience for which the physician could be liable, but less than 1% of them will take action against the physician.

These instances can be correlated with the total patient visits in an effort to appreciate the magnitude of the problem in relation to exposure to health care. Considering the variation between the previously discussed (Section A1) 840 million physician-visits and Pabst's conclusions suggesting approximately 1 billion physician visits in the United States per year, the incidence of a perceived negative medical experience per visit is approximately 1.5 to 3.9%. Given that of the 34 million patients who perceived negative medical experiences only 2.7 million consider seeking legal recourse, the possibility of a threatened malpractice claim per patient visit is approximately 0.2% or 1 in 500 patient visits. If each physician has an average of 20 visits a day, which may be high, this would amount to some 10 instances of potential malpractice action per year per practicing physician. This figure correlates well with the calculation made by considering the estimate of 1.9 million potential malpractice actions for 250,000 practicing physicians, or approximately 8 potential actions per physician per year. Thus, based on these calculations and given the figure of 2.7 million potential malpractice actions per year in the United States, we would estimate
that each physician is threatened some 8-10 times per year. But as will be discussed hereinafter, the number who actually file a claim is miniscule by comparison (1, p. 30). Consequently, most physicians have never had a malpractice claim filed against them.

Implications of Perceived Negative Medical Experience
(1) A - A5; (2) A - A6

A perceived negative medical experience engenders responses which tend to propel a patient towards the ultimate filing of a malpractice claim. For purposes of this thesis, those responses can be categorized as either economic or non-economic.

A4. NON-LAWYER ADVICE

Non-lawyer advice refers to advice which patients receive from family, friends, nurses, and from doctors other than the doctor involved in the patient visit in question.

IMPLICATIONS OF NON-LAWYER ADVICE
(1) A4 - A

In the Consumer Survey of those people who indicated that they had had a negative medical care experience, 40.8% stated that their reason for being dissatisfied resulted from statements of other medical personnel and 20.6% attributed it to statements of friends or relatives (multiple responses were possible) (10, p. 42).

(2) A4 - A8

Just as advice from non-lawyers plays a part in the patient's perception of a negative medical experience, so it also is a factor in the patient's consideration of legal action. The Consumer Survey revealed that of the patients who considered legal action, 38% of
them indicated that the idea had originated with their spouses (23%) or their friends, relatives or doctors (15%). (10, p. 43)

In their textbook, Medical Malpractice, Louisell and Williams point out that "critical remarks or acts by physicians in subsequent attendance are said to account for the filing of a large number of malpractice claims." (44, p. 139) They additionally note that "a relative or friend may be the first to suggest that the patient has been injured by medical negligence, or be the principal one to urge that the patient consider suit." (44, p. 146) However, it is equally true that relatives and friends and even physicians in later attendance may, by their comments, dissuade a disgruntled patient from considering legal action. The significant thing insofar as the system which we are modeling is concerned is that in numerous instances their comments do have an effect one way or the other.

A5. ECONOMIC MOTIVATION OF PATIENT

This refers to the motivation of a patient which is premised on a monetary loss.

IMPLICATIONS OF ECONOMIC MOTIVATIONS

(1) A5 - A8

Economic and non-economic motivations impinge on the disgruntled patient's consideration of legal action. For at least 53% of those patients who considered action, the genesis of that thought was economic and the most prevalent economic reason was to obtain money for medical expenses and to obtain money to compensate for the pain, suffering, aggravation and inconvenience caused by the unsatisfactory medical care. (10, p. 45) A significantly lesser
percentage sought compensation for lost income (32%) and payment for extra non-medical expenses (32%) (multiple responses were possible) (10, p. 45). There was a definite positive correlation between the size of the perceived economic loss and the number of patients who considered taking legal action. For example, one-fourth of those who estimated that their economic losses were $5,000 or more considered legal action. This was six times the percentage figures for those with no economic loss. (10, p. 66)

(2) A5 - B

There appears to be a definite correlation between the economic motivation of the patient as a result of his perceived negative medical experience and the filing of a malpractice claim. When queried as to their reason for acceptance of malpractice cases, the factor mentioned by a high percentage of plaintiffs' lawyers (58%) was the economic renumeration which the lawyer could expect, which was premised on the lawyer's estimate of the probable money damages (4, p. 38). 10/ A smaller percentage of lawyers, (10% of the National Survey and 23% of the Selective Survey) voiced this as a reason for case rejection. (4, p. 33-34) In contrast to other personal injury actions, the economic factor may play a more

10/ The reason advanced with the greatest frequency for case rejection (i.e., approximately 50%) and by almost half of the lawyers for case acceptance was whether the lawyer's analysis indicated liability. This would indicate that despite some physicians feeling to the contrary, lawyers do not accept cases simply on the basis of a bad medical result. In fact only 1% of the lawyers interviewed indicated that they would accept a case solely on "this tenuous inference of professional medical liability." (4, p. 39) If nothing else, the economic aspects would dictate against it since the survey showed that the average time spent on a losing case was 400 attorney hours (4, p. 211).
important part in the acceptance and rejection of malpractice cases because of the amount of time required to prepare and process such a case. Almost all attorneys interviewed in connection with the legal survey reported that malpractice cases required significantly more time than other negligence matters. Moreover, there is a larger period of time from case acceptance until case closing. Hence, the lawyer must "carry" the case without recompense for a longer period of time.

Since the economic aspects of the case play such an important role in the lawyer's decision regarding acceptance, it is clear that in those cases where the patient either considered or sought legal advice because of economic reasons (A5) (which is probably affected by whether there was in fact an actual (A2) as opposed to an imagined negative medical experience) it is much more probable that a claim will ultimately be filed. Conversely, where the patient's motivation for considering legal action is premised on non-economic grounds (A6) it is much less likely.

A6. **NON-ECONOMIC MOTIVATION OF THE PATIENT**

This refers to motivational forces which are premised on other than monetary reasons.

**IMPLICATIONS OF NON-ECONOMIC MOTIVATION OF THE PATIENT**

(1) A6 - A8

At least 53% of the patients who considered legal action did so for non-pecuniary or revenge-motivated reasons, e.g., to cause the medical person involved to be held up to public notice or to lose their licenses.
(2) **A6 - B**

As discussed in section A5 - B, if the patient who seeks legal advice is motivated by non-economic reasons, it is unlikely that a malpractice claim will be filed.

**A7. AFTER BILLING**

This refers to the billing of patients by physicians after the patients have perceived a negative medical experience.

**IMPLICATIONS OF AFTER BILLING**

(1) **A7 - A8**

Louisell and Williams (44) indicate that the billing by a doctor of a patient after he perceives that he has had a negative medical experience may give rise to consideration of legal action. They state that: "Some patients are willing to accept the consequences of what they assume to be malpractice if the physician does not press for payment of his fee. However, if an effort is made to collect the fee after the patient has shown reluctance to pay because he assumes the physician was negligent, the patient's restraint is likely to dissolve." (44, p. 141)

(2) **A7 - G**

It would seem to be apparent that the billing of a patient after a perceived negative medical experience would also serve to decrease his overall rapport with doctors which could have an affect on his perceptions in future patient visits even if it does not motivate the consideration of legal action vis-a-vis the instant visit.

**A8. LEGAL ACTION CONSIDERED**

Legal action considered refers to those patients that perceived
a negative medical experience who considered seeking the advice of a lawyer -- the next psychological step leading toward the actual filing of a malpractice claim. The Consumer Survey showed that only 8% of the respondents who reported a negative medical care experience indicated that they had even considered legal action. (10, p. 43)

IMPLICATIONS OF CONSIDERING LEGAL ACTION
A8 - A9

The Consumer Survey showed that only 37.8% of the patients who considered seeking legal advice actually talked to a lawyer. Thus, only 3% of those who perceived a negative medical experience actually sought legal advice.

A9. PATIENTS WHO SEEK LEGAL ADVICE

Patients who seek legal advice refers to those patients who moved from the contemplated state referenced in section A and A8 to the action state of actually seeking out a lawyer for advice.

IMPLICATIONS OF SEEKING LEGAL ADVICE
A9 - B

The Legal Survey prepared for SCMM showed that if one looks at all lawyers who considered malpractice cases 11/, they accept only 12% of the cases which patients bring to them. This acceptance is probably tantamount to the filing of a malpractice claim with the physician and/or his insurance company since the typical acceptance

11/ As previously discussed, the Legal Survey consisted of two surveys, i.e., a National Survey which is statistically predictable to the United States since it is based on a random sample from a national list of private practice lawyers and a Selective Survey of lawyers known to members of the SCMM as malpractice specialists.
process as described by lawyers interviewed in the Legal Survey was a three-stage procedure. The first stage consisted of a meeting with the potential client and an evaluation of the case in terms of liability and damages. If the case had sufficient damage potential and appeared to be a possible malpractice situation, the attorney then obtained an opinion from a physician as to whether there was negligence. Finally, the case is accepted if the physician's opinion corroborates negligence. (4, p. 36)

Interestingly enough the lawyers interviewed who specialized in malpractice estimated that in one-third of all the claims which patients brought to them there was actually malpractice involved. The discrepancy between this and the number of claims brought is primarily attributable to the economic factors discussed above (section A5 -B). However, whether one looks at the one-third figure or the 12% figure, it is clear that lawyers act as a buffer between the patient and the doctor. They screen out the overwhelming majority of cases where the patient has considered taking legal action against his physician. 12/ Only .36% of the patients who perceived a negative medical experience will end up as a malpractice claimant against the physician.

A10. NON-ACCESS TO PATIENTS' MEDICAL RECORDS

The non-access to patients' medical records refers to those instances where patients' legal representatives have been denied

12/ According to the Closed Claims Survey insurance carriers judged that 46% of the claims which were filed were legally merit- orious (1, p.16). Thus, even when measured by insurance company standards, the plaintiff-lawyers do a good job of screening out the poor claims.
access to the patients' medical records. The records generated by a physician in his treatment of a patient belong not to the patient, but to the doctor or hospital involved. Consequently, absent state law to the contrary, the access of a patient or his representative to those records can only be had with the consent of the physician or hospital. On occasion, doctors and hospitals have manifested their defensive attitudes vis-a-vis the malpractice threat by not allowing a patient's legal representative to have access to his medical records. Doctors often hesitate to turn over a patient's medical records to the patient directly but this refusal is seldom a defensive act. Instead, it is motivated by a concern for the patient's welfare. The situation to which we are referring is where a patient who has perceived a negative medical experience, has sought legal advice and the lawyer in his screening of the case prior to acceptance or after acceptance and prior to the filing of a claim has sought to examine the patient's medical records.

IMPLICATIONS OF NON-ACCESS TO PATIENTS' MEDICAL RECORDS

Denying a patient's prospective attorney access to medical records which he needs to determine whether to accept the case could lead, not just to the filing of a claim but to the institution of a law suit. For in 41 states this is the attorney's only recourse if he wants to examine the patient's records. Thus, there are some claims

13/ The nine states that allow patients access to their medical records without having to go to court are California, Illinois and Utah (lawyer can examine but no direct access by patient); Massachusetts, New Jersey and Wisconsin (direct access by patient); Mississippi (lawyer or patient with showing of good cause); and Connecticut (patient after discharge from care). (1, p. 216)
which might not have been filed if the lawyer had access to the patient's medical records. Conversely there are obviously also claims which were not filed but would have been if those records had been available.

The SCMM has recommended "that medical records should be made easily accessible to the patient through his legal representatives, private or public, without his having to file a suit." (Comm. Report, p. 217)

**A11. INCREASE IN EDUCATION AND INCOME OF PATIENTS**

Education and income of patients refers to the education of the patients as measured by the last grade completed in school and the patients' income before taxes.

**IMPLICATIONS OF EDUCATION AND INCOME OF PATIENTS**

(1) **A11 - A5**

As the income of patients increases, the relative value of money decreases and the resulting decrease in the psychological impact of increased medical expenditures should decrease the economic motivation for considering legal action. This might be offset to some extent by an expected increase in the medical, legal, and insurance awareness of those people in higher income brackets. Also, they are more likely to come into contact with lawyers on an informal basis and as discussed in J1 - A9, this type of contact is a fact in the consideration and seeking of legal advice.

(2) **A11 - G**

The Consumer Survey showed that there was a positive correlation between education and income and the number of incidents
reported. The authors of the Survey opined that a possible explanation for that result may stem from the decrease in social distance between the patient and the doctor which is achieved by virtue of the patient's increase in education and income. This results in a decreased deference on the part of the patient and a greater willingness (and ability) to question the doctor's words and/or actions.

(p. 50) However, this phenomenon could be offset to some extent by the closer social relationship that could be expected to develop between the high income and/or educated patient and his physician which might make the patient less prone to find fault.

A12. POPULATION INCREASE

The population increase is the annual population increase in the United States. This has been at the rate of approximately 1.1% per year since 1965.

IMPLICATIONS OF POPULATION INCREASE

(1) A12 - A1

The number of patient visits per year will obviously be affected by the annual population increase in the United States.

(2) A12 - J1

The total number of lawyers in the various states of the United States and the District of Columbia has increased from 286,000 in 1960 to 325,000 in 1970. (37) Although the number of new lawyers is a result of many factors, it would seem highly probable that there is some correlation between the increase in population and the increase in the number of lawyers since it can be expected that a certain percentage of the population will want to enter the legal
profession. Moreover, an increase in the population obviously engenders greater interpersonal contact and conflict which would result in a greater demand for legal services.

A13. UNAVAILABILITY OF MEDICAL ADVICE

The lawyers' inability to obtain medical advice refers to the refusal of doctors to give lawyers medical advice in malpractice cases.

Virtually all of the plaintiffs' attorneys 14/ (99%) involved in the legal survey advised that a very big factor in their acceptance of a case is whether medical advice and/or testimony is (or will be) available. (4, p. 41) As discussed above (A9 - B) doctor's advice is utilized in the preliminary screening of the case and if the case goes to trial a doctor's testimony is essential (unless the doctrine of res ipsa loquitur is applied) 15/ to establish the medical standards against which the doctor is to be measured.

14/ The patient in a malpractice suit is the plaintiff, i.e., the initiator of the suit; and the doctor is the defendant, i.e., the one against whom the suit is brought. More than 50% of the defendant's attorneys mentioned the need for expert advice as the dominant factor in case screening. (p. 41)

15/ Res ipsa loquitur is a legal doctrine which creates an inference of negligence once certain conditions are established. It thus allows a plaintiff to have his case reach the jury even though he produces no direct proof of acts or omissions constituting negligence on the part of the defendant. For the doctrine to become operative the plaintiff must prove: (1) that the event is such as will not ordinarily occur in the absence of negligence, (2) that the agency or instrumentality causing the harm was in the exclusive control of the defendant, and (3) that the event was not due to any contribution on the part of the plaintiff. Courts often voice a fourth requirement which is usually not regarded as indispensable, namely, that the evidence be more readily accessible to the defendant than it is to the plaintiff.
Numerous court decisions have referred to the "conspiracy of silence" and in essence have taken judicial notice "that it is difficult to obtain medical testimony to substantiate a plaintiff's claim in a malpractice suit, as physicians are reluctant to testify against each other." Richison v. Nunn, 57 Wash. 2d 1, 340 P. 2d 793, 802-3 (1959); see also Salgo v. Leland Stanford Bd. Trustees, 154 Cal. App. 2d 560, 568, 317 P. 2d 170, 175 (1957); Huffman v. Lundquist, 37 Cal. 2d 465, 484, 234 P. 2d 34, 46 (1951) (dissn). In its draft report, the SCMM, although recognizing that some courts had referred to the conspiracy of silence, commented that no data had ever been collected either to substantiate or disprove the charge. It felt that if such state of affairs had ever existed, it was much less prevalent now.

**IMPLICATIONS OF UNAVAILABILITY OF MEDICAL ADVICE**

A13 - B

As is evident from the above discussion (see also section A9 B), the lawyer-doctor consultation is a key factor in the initiation of malpractice claims and the non-availability of this consultation would tend to strongly impede the filing of malpractice claims. In order to establish the defendant-doctor's negligence, the plaintiff must produce a physician to testify as to the standard of care by which an alleged negligent act can be measured. Thus, absent the application of *res ipsa loquitur*, the non-availability of such testimony would result in a directed verdict for the defendant-doctor at the conclusion of plaintiff's case. However, thwarting the legal process in this manner would probably result in a decrease in
patient rapport while at the same time blocking the only practical outlet, i.e., legal action, for patient frustration engendered by that decreasing rapport. Ofttimes when such blockage occurs the legal system creates remedies which keep the social system from erupting. For example, the application of the doctrine of res ipsa loquitur to medical malpractice cases arose because of the judicially perceived "conspiracy of silence" (see section A13) which some courts believe exists on the part of the medical community insofar as the furnishing of expert testimony and/or consultation in malpractice cases is concerned.

**A14. CONTINGENT FEE**

The contingent legal fee refers to the method of payment for legal services whereby the client pays the lawyer little or nothing if he loses his case and if he wins pays the lawyer a certain percentage of the recovery, usually between one-third and 40% but occasionally as high as 50%. This method of payment is used by virtually every plaintiff's attorney in personal injury cases in the United States, 16/ one segment of which are malpractice cases (1, p. 89).

As stated by the SCMM in its report:

"No subject in the entire field of medical malpractice has evoked more bitter feelings between physicians and lawyers than the contingent legal fee system under which most malpractice suits are pursued. Many doctors are convinced that the contingent fee system is the very root of today's malpractice problem, and any number of them

16/ The contingent fee system is prohibited in Great Britain and in six of Canada's twelve provinces. In both countries the number of malpractice claims is much smaller but the SCMM's report concludes that: "differences in their social, legal, and health-care systems and ours make discussions of the comparative effect of the contingent legal fee essentially irrelevant." (1, p. 90)
have proposed its outright abolition as the most effective way to solve the problem." (1, pp. 87-88)

**IMPLICATIONS OF THE CONTINGENT FEE**

(1) A14 - A9; (2) A14 - B

The presence of the contingent fee payment system obviously has a positive influence on the number of patients who seek legal advice and on the percentage of malpractice claims filed. This is because it enables those patients who otherwise would be unable to pay for legal services to consult with a lawyer and if he determines that their case is meritorious to have it processed as a malpractice claim. The Legal Survey looked at the time spent by malpractice lawyers on malpractice cases which were lost and by applying an average hourly fee found that the average legal fee for those cases on a straight fee basis would have been $22,000 and the median fee would have been $12,000 (4, pp. 101-2). Considering that the median income in the United States was $9,870 in 1970 (4, p. 102), it is fairly obvious that very few persons would consider legal action in medical malpractice cases if it meant that they would be risking a possible legal fee in excess of $12,000. Couple this with the fact that the Consumer Survey showed that approximately 77% of the consumers were aware that the lawyer's compensation in malpractice cases was either wholly (47.3% of consumers) or partially (30.5%) on a contingent fee basis, and it is clear beyond peradventure that the contingent fee system has a positive effect on the number of patients who seek legal action and ultimately on the number of patients whose cases are accepted and processed by lawyers.

-40-
It is possible that if a lawyer engaged in some form of expected value analysis in screening cases, it might result in his acceptance of a case where the potential plaintiff's monetary damages were extremely large, e.g., in the million dollar range, while the liability aspects of the case were only marginal. But absent this extreme situation, it is doubtful that the contingent fee system encourages lawyers to bring cases which they evaluate as unmeritorious since the lawyer only recovers if he has accepted a winner. If he accepts a loser he invests time for which he will not be compensated and the Legal Survey showed that anywhere from 240 to 440 hours are spent by lawyers on cases which result in zero recovery.

If anything, the contingent fee system, as contrasted with a straight fee system, probably encourages lawyers not to take cases of doubtful merit for if the lawyer is being compensated on a fee for service basis, he would be paid for his time without regard to whether the client was successful. Because of economic considerations, both the contingent fee and the fee for service system have a negative effect on the filing of legally meritorious malpractice cases involving relatively small potential recovery. Under the contingent fee system, the lawyer's recovery in such cases would probably not compensate him adequately for the time he would have to invest; and under the fee for service system, the client's expected recovery after legal fees were deducted would be de minimus (or possibly even a minus) amount.

Thus, although the existence of the contingent fee system
results in more unmeritorious cases being screened out by lawyers than would occur under a fee for service system, it still has a net positive effect on the malpractice system because it allows for the prosecution of claims by patients who would otherwise be unable to afford legal representation.

Physician after physician who testified before the SCMM complained that the contingent fee was an incentive for lawyers to seek irresponsibly high judgments. (1, p. 89) The fact that the lawyer's fee is directly controlled by the amount of the plaintiff's recovery may give the lawyer an incentive to seek the highest recovery which he can obtain for his client. But since the lawyer should seek the greatest recovery which he can fairly obtain, whether he is being compensated on a contingent fee or a fee for services basis, it is hard to find any unfairness to physicians in furnishing the lawyer a direct monetary incentive to achieve this end. Moreover, in the Legal Survey data was collected on hours actually spent on malpractice cases by plaintiffs' lawyers (no recovery as well as recovery cases) and the fees earned by those lawyers. Although these figures revealed a differential between plaintiffs' and defendants' lawyers (who are normally compensated on a hourly fee basis) the Commission found that the difference, which favored the plaintiffs' lawyers, was 'not large enough to warrant the conclusion that plaintiffs' lawyers are earning unconscionably large fees in malpractice cases, when compared to the fees charged by their legal counterparts in malpractice cases.' (1, p. 92)
B. MALPRACTICE CLAIMS FILED

"Malpractice claims filed" is defined as the filing of a malpractice claim with the doctor and/or his insurance company. The claims are measured in claims per capita per year. Our information from the insurance companies and the SCMM's Report reveals that approximately 12,000 malpractice claims were filed in 1970 (1, p. 23) which is .0003 claims per perceived negative experience.

After filing a claim with the insurance company and/or the doctor, some cases are settled by the insurance company without the necessity of litigation. Of those that are denied by the insurance company some are litigated and of those that are litigated obviously the plaintiff-patient prevails in some and in the remainder the defendant-doctor prevails. The data which we obtained from the Commission indicates that one-half of the claims which are filed are closed without ever becoming law suits (1, p. 15). The Legal Survey indicated that a substantially higher percentage of claims actually proceeded to litigation (68% National Survey; 90% Selective Survey) (4, p. 207).

IMPLICATIONS OF MALPRACTICE CLAIMS FILED

(1) B - N

Obviously in some malpractice claims the claimant-patient is successful. The Legal Survey indicates that this occurs in 68-79\(^{17/}\) of the cases (4, p. 208) while the Closed Claims Survey of insurance company files indicates a significantly lower recovery rate of 41%.

\(^{17/}\) The National Survey indicated 68% and the Selective Survey indicated 79%.
(47% against doctors and 33% against hospitals) which increased to 60% when considering only those cases in which a law suit was filed. 18/ (1, p. 15) Both the Legal Survey and the Closed Claims Survey showed that the majority of recoveries by the claimants result from a settlement and they both showed that most settlements occur after the filing of a law suit (1, pp. 15-16; 4, p. 207). Using the Closed Claims Survey percentage and the lower percentage from the Legal Survey, this would mean that somewhere between .16% and .24% of the patients who perceived negative medical experiences will eventually be successful claimants against their physicians.

(2) B - O

The malpractice claims filed are undoubtedly a significant factor in the physician's awareness of a threat. Most of the physicians we interviewed, referred to the fact that they were made aware of such threat by hearing about it from colleagues. Other than for specific instances when they could recall where a friend or colleague was threatened with a suit on issues they deemed not justified, this socialization process is frequently not founded on hard fact. Thus, the physician fears the capricious acts of patients and/or lawyers seeking recourse on matters that the physician cannot properly control or predict. In this regard, the gross information lack of physicians concerning the exact significance of the threat suggests that there is an inappropriate information system used by physicians.

18/ Interestingly enough, the Closed Claims Survey indicated that 9% of the successful claimants are paid prior to the filing of a formal claim as a result of incident reports by doctors and hospitals to their insurance companies (3, p. 17).
to perceive the magnitude of a threatened malpractice claim. As stated above, most of the physicians whom we interviewed had never been subjected to a malpractice action and could only recall that they felt it to be a significant problem. We believe the media may play a part as an intervening factor, increasing the magnitude of the threat perceived by physicians per malpractice claim filed (see the discussion in Section N1), we have been unable to accurately document how significant a part the media plays in this regard. From our survey the physician's awareness of the threat seemed out of proportion to the absolute incidence of malpractice claims filed and monies awarded in malpractice actions.

C. DEFENSIVE ACTS

Defensive acts are defined as activities a physician does in response to a perceived threat. While they may be measured in resources consumed per patient visit, the exact number is very difficult to ascertain. Defensive acts can take the form of an active act in which the physician does something for a patient not designed to benefit the patient, but rather to protect the physician from potential liability; or of a passive act where a physician fails to do something, e.g., operate in a marginal case because of his fear of potential malpractice liability.

A tragic example of this came out in the hearings which the SCMM held in Los Angeles, California. An eye, ear, nose and throat specialist described the situation where the medical group to which he belonged was the most skilled and experienced group in the country in performing an unusual, rare, high-risk operation by virtue of having
performed a previous operation of that type. However, the previous operation had resulted in a malpractice suit wherein the plaintiff had recovered $160,000. Because of their fear of exposure to another malpractice action, as of the date of the doctor's testimony, the group was refusing to perform a similar operation on a child despite frantic pleas of the child's parents and the family priest. The high-risk nature of the operation had been explained to the parents but since the child's problem could be fatal without the operation, the parents were most anxious to have him undergo the surgery in question and agreed to sign any consent form the group would prepare. (35, pp. 177-202)

From our survey it appears that most of the defensive acts are of an active nature and take the form of a physician covering himself by superfluous consultation from other physicians or by ordering additional diagnostic tests which the physician does not believe will necessarily help the patient. Some physicians felt they were more likely to undertake defensive acts when the threat is based on fear of peer admonishment than they were when the threat is based on legal liability. We have not been able to separate clearly these two motivational forces behind defensive acts. The magnitude of the defensive medicine problem we will discuss is estimated only from the legal liability component. The magnitude of the total defensive medicine problem in terms of resources consumed (cost) is obviously greater than would be appreciated from our restricted estimate.

An additional component of legal defensive acts relates to the
need for malpractice insurance coverage for which health care providers spent between 200 and 300 million dollars in 1970 (1, p. 31).

Faced with some approximately 65 million dollars of malpractice awards in 1970, the amount of resources consumed in legal defensive acts seems inappropriately high on a cost-benefit analysis. While we were unable to adequately ascertain the entire cost of active legal defensive medicine, one component can be estimated in the use of x-rays, which we have selected because the most concrete data are available in this regard.

IMPLICATIONS OF DEFENSIVE ACTS

(1) C - D

We have chosen the use of x-rays as a component of active defensive medicine because of our interest and the fact that x-ray utilization is a more readily measurable component of active defensive medicine than is the incidence of consultation or use of other laboratory diagnostic procedures. While it is impossible to say the exact number of x-rays ordered on the basis of legal defensive acts, our survey suggested a significant portion of total x-rays used are due to this. The range of x-rays and other diagnostic procedures used due to defensive acts is from about 22% seen in a survey of physicians in California and North Carolina conducted by the staff of the Duke University Law School Review in 1971 (42) to some 71% in an American Medical Association opinion survey.

This amount was computed from data set forth in the SCMM Report (1, pp. 19, 20).
of its members conducted in the Spring of 1972 (41a). Interestingly, 74.4% of Pacific states physicians stated that they ordered extra procedures because of the malpractice threat while only 62.6% of New England physicians categorized their activities in this way. The impressions of the physicians we interviewed were that about 60% of diagnostic X-rays were ordered for defensive purposes. A study by the American College of Surgeons revealed that 63% of surgeons acknowledged using x-rays for legal defensive purposes (39). It seems reasonable, however, that in any one instance, the physician's judgments concerning the choice of a diagnostic modality is not based on any single motivating factor but rather may represent an amalgamation of more than one factor modifying his behavior. From the data we have been able to obtain from interviewing physicians who use x-rays and from others who interpret them, we suggest that approximately 30% of total x-rays ordered are related to the physicians' concern for the potential malpractice threat and are not primarily designed to assist the patient. Interestingly, in specific instances when x-rays are ordered with the physician's avowed interest of efficacy, when really pressed the physician will admit that efficacy, seems improbable. The most common secondary indication resorted to is, "Well, if I didn't do this, I might be sued." Thus, the implication of

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19a/ One explanation for the low percentage in the Duke University survey might be that physicians are more candid in responding to a survey made by medical associations than one with which a law school is connected. It might also be explained by the fact that instead of a general inquiry, the questions pertaining to defensive x-rays referred to two specific x-ray procedures, i.e., x-ray of the mastoid when a patient complains of dizziness following trauma and x-rays where the patient has bruised ribs (42, pp. 979-80).
defensive medicine is that many times physicians will use x-rays which are less than 100% efficacious because of the implications of other factors. Based on our interviews and the available impressions from the literature, it seems reasonable to suggest that approximately 30% of total x-rays used are related to defensive acts by physicians.

Given this 30% estimate, the cost becomes most impressive. According to the Bureau of Radiological Health data, the number of x-ray examinations in the United States grew from 100 million in 1964 to 142 million in 1970 (53). At an estimated average rate of 25 dollars per examination, the total amount of money spent in diagnostic radiology in 1970 amounted to some 3 billion dollars. This calculation correlates well with the estimate of the Bureau of Radiological Health that diagnostic x-rays account for some 6% of the health care budget which was approximately 67 billion dollars in 1970. If some 30% of these were for defensive purposes, the magnitude of defensive medicine in just the use of x-rays approaches 1 billion dollars per year in the United States in response to a total malpractice award of 50 million dollars. Thus, some 20 times as much money is probably spent in the defensive use of diagnostic x-rays as is awarded in the entire malpractice arena of which only a small part could potentially have been averted by a defensive use of diagnostic radiology.

(2) C - E

Malpractice insurance is entirely ordered by a physician to

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20/ This estimate was furnished by personnel from the American College of Radiology and the Bureau of Radiological Health.
defend himself against the threat of malpractice. This relationship is clearcut. It is fair to say that all malpractice insurance is predicated on this motive.

(3) C - A13

The manifestation of the defensive act referred to here is in the doctor's refusal to consult with lawyers when they are analyzing the case of a prospective client, (i.e., a patient who has sought legal advice (A9) in an attempt to make the preliminary determination (which is the threshold decision for case rejection or acceptance, see A9 - B) of whether there has been a negligent act by the doctor which proximately resulted in damage to the patient; and whether he will be able to obtain medical testimony to support that position if a trial is necessary.

D. X-RAYS ORDERED

X-rays ordered is defined as the total number of examinations employing diagnostic x-rays in the United States per year. There is an inhomogeneous demographic distribution of the x-rays utilization and in the rate of change of x-ray utilization in various standard census regions of the country. The Bureau of Radiologic Health data comparing the 1964 to the 1970 survey revealed a 12.6% increase to .637 exams per person in the northeast regions while the north-central had an 18.8% increase to .747 exams per person. The south revealed a 19.8% increase to .709 exams per person while in the west the figures were a 3% increase to .749 exams per person. When this data is compared with the number of visits in the various census regions we find that the probability of an x-ray examination
per patient visit in the northeast region of the country is 14.5% while in the north-central it is 18.6% the south has 17.3% and the west 16.3%(53). Thus, although initially it appeared that there were more x-ray examinations performed in the west where there is a higher incidence of potential malpractice threat, we were unable to demonstrate adequately an increased x-ray utilization per patient visit which could correlate with this impression. Indeed, both the growth of x-ray utilization over the duration of the perceived increased malpractice threat and the distribution of x-ray utilization could not adequately be correlated with the suggested demographic distribution of malpractice claims (1, pp. 23-27). We were unable to come up with a reasonable correlation between the change in x-ray utilization or x-rays per patient visit in relation to the demographic distribution of malpractice liability. Thus, this portion of the data does not support the contention that the number of x-rays per patient visit correlates with the anticipated malpractice threat.

**IMPLICATIONS OF X-RAYS ORDERED**

(1) D - F

An increased use of x-rays would theoretically increase the cost of health care. Indeed, as stated above, diagnostic radiology accounts for somewhat over 3 billion dollars a year in annual health care costs. While it is apparent that any increased use of x-rays which are not designed to help the patient, but rather to protect the physician from a threat, would clearly increase the cost of health care. However, the point should be made that the use of x-rays for efficacious purposes may at times diminish the total cost of care.
in that they may more efficiently point to a diagnosis thus allowing a patient earlier release from the hospital than would otherwise have been obtained. The exact estimate of benefit from x-rays resulting in decreased health care cost is very difficult to ascertain. The use of x-rays for innovative, curiosity or habit purposes would not be anticipated to decrease the cost of health care as seen for efficacious indications since these actions would not be destined to improve on the efficiency of patient management.

(2) D - I

Theoretically x-rays used for efficacious reasons establish the legal standards of care. However, since the motivating force behind the use of x-rays is not always clear if a procedure is used for defensive purposes and this becomes commonplace it could establish a standard of care even though it was not primarily intended to help the patient. Thus, by initially ordering x-rays for defensive purposes a physician may be contributing to the establishment of a required procedure. If enough of his brethren act in the same manner that procedure will become so routine for that type of incident that it becomes part of the norm by which the medical community's actions are judged vis-a-vis a particular type of illness or injury. This problem is now accentuated by the loss of the locality rule in that the legal standard of care no longer depends upon the local custom but rather depends on a more broadly applied norm.

(3) D - X

It is evident from the discussion in the previous section that the x-rays ordered have a distinct influence on the perceived medical
standard of care. When faced with the socialization process in clinical medical practice, a medical standard of care may be established where the motivational force behind the use of the procedure may not be based on diagnostic efficacy.

E. MALPRACTICE INSURANCE COVERAGE

Malpractice insurance coverage is defined as the dollars consumed per capita and per patient visit in malpractice insurance premiums. In 1970 physicians, other than surgeons, spent an average of $621, which was 1.8% of their average annual income, on malpractice insurance coverage; and surgeons spent an average of $1,881, which was 4.2% of their average income, for such coverage. This rose from an average of $133 (.5% of income) for non-surgeons and $378 (1.2% of income) for surgeons in 1964 (1, p. 32). Malpractice insurance cost is increasing at a rate far greater than the average cost of other medical expenditures; in part due to the increase in both the number and size of malpractice awards, which amounted to approximately 65 million dollars in 1970 (see 1, pp. 19, 20).

Insurance companies justify the increase of malpractice insurance premiums to a greater degree than the increase in current awards, by the time lag between the period of insurance coverage and ultimate liability for damages. This time lag is substantially longer for medical malpractice claims than for other types of tort claims because of the manner in which the statute of limitations is applied in medical malpractice cases (1, p. 20). In numerous medical situations, the statute begins to run when the patient perceives, or should have perceived the negative malpractice experience rather than at the time
the experience occurred. Thus, the insurance companies establish their premiums on the basis of anticipated claims where the malpractice may not be recognized for some years hence. They are faced with a remarkable growth of recognized malpractice incidents.

**IMPLICATIONS OF MALPRACTICE INSURANCE**

(1) E - F

Malpractice insurance premiums clearly increase the cost of health care providers and thus it can be expected that as such premiums rise, the increase will eventually be passed on to the patients and cause health care costs to increase. For example, approximately 50 cents of the daily cost to every patient going into the hospital and 20 to 50 cents out of every $10 physician's fee is for malpractice insurance (1, p. 31).

(2) E - J

The availability of malpractice coverage by a physician does alert a lawyer to the fact that it may be possible to obtain monies that the physician himself would not ordinarily have access to. Considering the physician's relatively high income level, high insurance coverage is more likely related to the increased amounts of claims rather than the number of such claims. Here too, the media appears to be an important intervening factor since the most probable source of this information transfer is both through professional journals and public dissemination of the size of malpractice awards.

(3) E - M

The fact that the physician has malpractice insurance increases the patient's probable awareness of such insurance coverage.
This awareness alone may be an important agent effecting an increase in malpractice claims filed since the patient will know that the defense of, and the recovery in such an act is not an economic burden to his physician. Indeed, one physician we interviewed suggested that this may be such a predominant factor that he abandoned his malpractice insurance after having sustained a malpractice loss. Patients' knowledge that physicians buy malpractice insurance is most probably related to the media announcement of malpractice settlements. Thus, the media may provide an important intervening factor affecting this communication.

F. COST OF HEALTH CARE

In 1970 the estimated total cost of health care in the United States was some 67 billion dollars. This amounts to approximately $335 per capita and approximately $80 per patient visit. Admittedly, health care costs are not related to patient visit per se, inasmuch as most of the health care cost is in hospitalization expenses which are not necessarily correlated with patient visits. That is, the some 1 billion patient visits per year result in only 30 million hospitalizations. The average hospitalization cost per patient day in 1970 was approximately $78 in the most common short-term general and special hospital (40).

We have not been able to adequately ascertain the amount of health care cost relegated to defensive practices since we could not measure the cost of increased consultations initiated on a defensive basis or the increased use of many other diagnostic procedures. Thus, our estimate of the 1 billion dollar defensive x-ray cost is but
one component that defensive medicine imparts to the total health care costs.

IMPLICATIONS OF INCREASED COST OF HEALTH CARE

(1) F - G

The major implication of health care costs in relation to this thesis has to do with the effect that health care cost has on-patient rapport. In our discussions with insurance companies and in the Consumer Survey it is apparent that many people feel that health care costs have risen out of proportion to the rest of consumer expenditures, and this increase is not warranted by what they see as the benefits of medicine. Many consumers and some individuals in government consider that health care is a natural "human right" for which individuals should not have to pay. As a right, it becomes the responsibility of "society" and thus, there is an increasing need for some form of governmental health insurance. Much of the antagonism felt by some patients toward physicians in general is related to the increased cost of this natural "human right."

The insurance people we interviewed felt that a prime reason for patient disaffection in those who perceived a negative medical experience was the fact that they had to pay for this experience. And as discussed in section A7 - A8, many patients would not have considered a malpractice action after a perceived negative medical experience if they were not repeatedly billed for such an experience.

G. PATIENT RAPPORT

Patient rapport is defined as the subjective impression of
the patient-physician relationship. A change in this rapport could perhaps best be measured as the incidence of disaffection patients perceive for their doctor per patient visit. While there are no hard data on this exact number, the Consumer Survey revealed that some 42.5% of patients felt that at sometime during their lives either they or a member of their immediate family underwent a negative medical experience for which the physician may ultimately be liable. The fact that so few of these have resulted in malpractice actions is apparently due to the warm feeling the patients have for their immediate physician and the fact "they do not wish to harm him".

At a Sloan Fellows' seminar in February, 1973, Dean Robert Ebert of Harvard Medical School opined that patient rapport has not decreased over the past 30 years, that is, most patients seem to have good feeling toward their doctor. However, he did not address the problem of a general increase in social dissonance between patients and physicians and the animosities engendered in patients by the increased cost of health care. It may be quite possible for a patient to feel good toward his doctor while developing an increased animosity toward the medical profession in general. Indeed, at times, at least some of the physicians we interviewed emphasized patient-rapport at the cost of optimal scientific patient management. They felt it was important to maintain patient rapport since the patient's rapport with, and confidence in his physician is a major factor in the effectiveness of health care.

Most people interviewed in the Consumer Survey (10, p. 23) and most of the physicians we interviewed felt there was a gradual
trend for decreased patient rapport in the practice of medicine much of which they ascribe to a loss of the doctor-patient relationship in vogue some 20 or 25 years ago in the "horse and buggy doctor" era. An additional component of altered patient rapport is felt to be the general psychology of increased adversary relationships. In this regard it is important to point out that many patients perceive that doctors in general are not as concerned with the patient's immediate welfare as they used to be, but this attribute of the medical profession does not hold true for their individual physician. That is, patients tend to maintain an affection for their individual physician, while recognizing an increased dissonance between physicians and patients generally.

IMPLICATIONS OF PATIENT RAPPORT

(1) G - A

A decrease in patient rapport is in part responsible for increased perceived negative medical experience. Patients may become disaffected with the doctor at times when there is no negligence or indeed damage other than the normal course of their illness. This disaffection alone may cause the patient to conclude that there is a negative medical experience. This is, to some extent supported by the fact that the Consumer Survey shows those people who felt the doctor-patient relationship had deteriorated over the last 20 years also perceived more negative experiences (10, p. 57). A major factor in this relationship has to do with the patient's perception that health care costs are inappropriate for the results they perceive.
A decrease in patient rapport appears to be an essential catalyst relating the perceived negative medical experience to the consideration of legal action. Extrapolating the conclusions which we have reached using the data from the Consumer Survey, shows that only 3% of the patients who perceived negative medical experiences can expected to seek legal advice; and only .36% of those patients will actually file a malpractice claim. The fact that relatively few patients consider legal action and even fewer actually file malpractice claims per perceived negative incident suggests intervening factors, the most important of which appears to be the individual physician-patient relationship (patient rapport). Although this rapport may not be the only factor affecting the chain from perceived incident to malpractice claim, it must be considered the most significant on the basis of our survey. For example, in the Consumer Survey, three-fourths of the patients who perceived that their negative medical experience had resulted in losses in excess of $5,000 still had not considered legal action (10, p. 66). This must be attributable in large part to doctor-patient rapport and if such rapport is diminished the chances of a malpractice claim being filed could obviously increase by several orders of magnitude—considering the ratio of claims filed to negative incidents perceived which presently exist.

An increase in patients' knowledge of the legal responsibilities of a physician (K), the fruits of medical care (L), and the fact that physicians are covered by insurance (M) all serve as intervening factors in increasing the probability that an initial
perceived negative medical experience will ultimately result in a malpractice claim being filed. In this connection, it should be noted that even though at every juncture along the road from perception, to claim filing, to successful claims more and more patients who have perceived a negative medical experience are weeded out, those who fall by the wayside still have an affect on the system. The Consumer Survey showed that previous exposure to the legal system is positively correlated to seeking legal advice (10, pp. 73-75) and the more direct the exposure the greater the correlation. Hence, it could be expected that all those who fall by the wayside between perception and success have a better understanding of the medical, legal (and possibly insurance) aspects of the malpractice area by virtue of their experience and possibly there is an overall lessening of their rapport with doctors. Therefore, the next time they are a patient, they are more likely to perceive a negative medical experience 21/ (especially if one has in fact occurred), and more likely to seek legal redress if the economic loss is sufficient. Moreover, they also have an impact on the perception and institution of legal action by friends and relatives who consult them vis-a-vis their treatment since as previously noted advice of friends and relatives plays an important part in a patient's perception of a negative medical experience and his consideration of taking legal action (see sections A4-A and A4-A8).

21/ The Consumer Survey found that "those already holding negative attitudes will be more likely to interpret a given medical experience as negative." (10, p. 52) Hence, if a previous perceived negative medical experience gives rise to a negative attitude regarding the medical profession, this effect will be felt in subsequent patient visits.
H. GROWTH OF MEDICAL KNOWLEDGE

This can be defined as the relative increase in total information available for the care of the sick against the standard amount of information at some time in the past. While the exact figure may be difficult to ascertain it is generally concluded that all knowledge is growing considerably over the past 20 years and knowledge in medicine has increased as rapidly as in any other arena. In fact, it has been said that almost one-half of total medical knowledge available today was discovered within the past 20 years. This growth of knowledge has many implications on the practice of medicine and upon the social system in which medicine finds itself. The National Institutes of Health advised that in the past two decades, the growth of federal expenditures for biomedical research has increased from less than $50 million to approximately 1.2 billion dollars a year.

This growth of medical knowledge has many ramifications, some of which are especially pertinent to this thesis.

IMPLICATIONS OF GROWING MEDICAL KNOWLEDGE

(1) H - A12

The growth of medical knowledge has an impact both negative and positive on the population increase. The positive impact stems from those medical advances which affect longevity, fertility and decreased infant fatality while the negative impact is a result of advances in birth control.

(2) H - P

The growth of medical knowledge directly increased medical
specialization in that it is no longer possible for the physician to be a complete generalist. In 1900 it was quite possible for any single physician to know pretty much of what was known in medicine, at least that which could benefit the patient. Since this is no longer true, the growth of medical knowledge has a rather clear-cut relationship to the increase in medical specialization. As more knowledge is accumulated, it becomes virtually impossible for any physician to feel entirely secure in his knowledge of the total medicine needed to care for all of a patient's complaints. Thus, he must increasingly refer patients to specialists. Consequently, if a physician goes into primary care medicine he actually becomes a referral center for many of his patient's problems. Since this is not considered a particularly appealing position, the growth in medical knowledge is a primary factor leading to increased medical specialization.

(3) H - F

The effect that the growth of medical knowledge has on the cost of health care is somewhat more controversial. Growing knowledge has increased technology, and the number of costly procedures that can be used in patient care. However, some aspects of growing medical knowledge have apparently decreased health care costs. An argument used before Congress to support health care research has been that increased medical knowledge has improved the quality of human capital by making more patients available to be productive who would otherwise be sick. Thus, advanced knowledge may also contribute to the efficiency with which diseases are managed. The relative magnitude of these two divergent
components, i.e., growth of knowledge increasing health care costs and growth of knowledge decreasing health care costs cannot be stated with certainty.

(4) \( H - U \)

The growth of medical knowledge no doubt is in part responsible for the increased availability of diagnostic procedures. As available procedures become more efficient in both cost and ease of application, they become more homogeneously distributed to the sick population. This is particularly true for some of the more modern x-ray procedures where simplified equipment allows complex procedures to be performed by the relative novice. Thus, a growth of knowledge and technology allows for diffusion of newer procedures come to ultimate clinical efficacy and although many of the new procedures from the academic medical centers into the remote areas of health care.

(5) \( H - T \)

The growth of medical knowledge is a primary basis for the formation of new diagnostic procedures. Relatively few of the new procedures are applied to patient care, relatively few of them stand up over time to significantly contribute to the welfare of the sick patient. Thus, there is a clear-cut relationship between the growth of medical knowledge and the quantity of new diagnostic procedures applied on the basis of innovation and curiosity rather than on the basis of efficacy in health care.

(6) \( H - I \)

As more procedures become available physicians are expected
to know more about a disease process and its proper management. Thus, as knowledge increases, the legal standards of health care quality are also prone to increase.

(7) H - L

Growing medical knowledge increases the patient's awareness of what medicine may have to offer. The public receives news of medical advances with enthusiasm. The publicity given such advances is in part due to the fact that medical researchers have to sell their product to the public to obtain federal support for their efforts.

(8) H - N1 - A

The media represents a most important information source in this portion of the system. Many of the "spectacular" advances in medicine have been accentuated by television, occasionally far beyond their realistic potential contribution to health care. This oversell, which is not necessarily due to the medical researchers' efforts but rather could be ascribed to the charisma of medicine, accentuates the patient's awareness and anticipation that medicine can do something for him if he becomes ill. The fact that it cannot, when realized, may in part be responsible for the number of malpractice claims filed.

I. LEGAL STANDARDS OF CARE

The standard of care which the law requires to be utilized by any defendant in a tort case is determined by what a reasonable man similarly situated would do. In the case of a physician the reasonable man similarly situated is a reasonable physician confronted with the incident in issue. Hence standards of care are established by the acts of the medical community. A physician is expected to
practice the quality of medicine equivalent to the best medicine available. This is a recent change from the locality rule where previously physicians were only required to practice the standard of medicine that was practiced in their own community. This diffusion of legal standards based on a national norm tends to increase the legal standards in the less advanced communities. The standards are set by what physicians everywhere are currently doing. This fact may significantly restrain any attempt to change the current practice of defensive medicine in that many physicians fear legal recourse if they go against current standards of care even though the motivational force behind those standards may not be based on diagnostic efficacy.

**IMPLICATIONS OF LEGAL STANDARDS OF CARE**

(1) \( I - J \)

As legal standards of care increase, it means that when the lawyer is making the initial determination as to whether a complaining patient has a case (see section A9 - B) he is judging the doctor's actions against a higher standard of care which obviously increases the possibility that the doctor's conduct might be found wanting and thus increases the chance that the lawyer will conclude that the client has a worthy case. Since lawyers are no more immune to the laws of economics than any other profession, an increase in the number of complaining patients with worthy cases is in essence an increase in demand for legal services in the malpractice area which will attract lawyers in related areas, such as ordinary personal injury lawyers, who are looking for business.
As legal standards of care increase, physicians' actions are being judged against higher standards, and therefore, the number of successful claims could also be expected to increase.

J. LAWYERS' INTEREST IN MALPRACTICE

Lawyers' interest in malpractice can be defined as the total effort that lawyers spend in the medical malpractice field. Although we have been unable to obtain hard data in this regard, it could theoretically be quantified as the percentage of total legal man-hours devoted to this area and as the absolute number of hours lawyers devote to medical malpractice per capita and per patient visit. Were these hours available it would also be possible to calculate the cost of legal effort per patient visit.

IMPLICATIONS OF LAWYERS' INTEREST IN MALPRACTICE

(1) J - B

The availability of malpractice business for lawyers and their interest in this activity does tend to increase the number of malpractice claims filed, or at least it serves to be an intervening activity when the patient presents the lawyer with an expression of having undergone a negative medical experience. The amount of lawyers' interest and the relative magnitude of the claim no doubt affect the probability that an individual event will be perceived as sufficient to warrant filing a malpractice claim. We have heard that minor claims, i.e., where the expected recovery is less than $8,000 will not be accepted by a lawyer because the amount of potential remuneration to the lawyer is insufficient to warrant
the expenditure of the necessary time and effort. Many instances where the patient initially goes to the lawyer for advice result in the initiation of more than one malpractice claim, i.e., against the primary physician, consulting physician, and the hospital. Thus a single perceived negative medical experience may be expanded by a lawyer to more than one malpractice claim. However, if litigation ensues these claims would probably all be joined into one law suit with multiple defendants.

(2) J - K

The lawyer's interest in malpractice may increase the patient's awareness of a legal recourse to a perceived negative medical experience (see the discussion in section J1 - A9, Infra). In addition, the popularization through the media of successful lawyers (e.g., Melvin Belli) has served to increase the public's awareness that they can seek recourse if they suspect they have sustained a negative medical experience.

J1. NUMBER OF LAWYERS

The number of lawyers refers to the number of persons admitted to the bar in the 50 states of the United States and the District of Columbia.

In 1960 there were 285,933 practicing lawyers in the United States which increased to 324,818 in 1970 (37); of this number, some 225,000 (excluding patent attorneys)--which had increased to about 237,000 by 1972--were in private practice (4, p. 31). A projection of the Legal Survey data reveals that during the time frame of that Survey (January, 1970 to September, 1972) only 27% of the private
practice lawyers had handled malpractice claims or cases (4 pp. 27-31).

IMPLICATIONS OF THE NUMBER OF LAWYERS

(1) J1 - A9

The report of the Legal Survey indicated that "claims of medical malpractice are brought to lawyers' attention both formally (e.g., visit or call to lawyer's office) and informally (e.g., at a social gathering)". (p. 29) Those claims which come to the attention of the legal community via social gatherings would undoubtedly increase as the number of lawyers in the country increased since this would increase the likelihood that patients contemplating legal action would come into contact with lawyers. Moreover, it is conceivable that as the supply of lawyers increases, lawyers as a whole might be more receptive to informal discussions with disgruntled patients, and even lecture to laymen on the subject of malpractice so as to stimulate their legal awareness.

(2) J1 - J

As discussed in J1 - A9, the number of lawyers interested in medical malpractice is obviously affected by the number of lawyers admitted to the bar.

K. PATIENTS' LEGAL AWARENESS

This is defined as the number of patients aware of the legal implications in health care and the relative acuity of their awareness of physicians' legal responsibilities. The Consumer Survey revealed that few people demonstrated a complete understanding of all the concepts of medical malpractice. However, although not highly informed,
a solid basis of information was found to exist so that varying proportions ranging up to one-half gave substantially correct responses. This understanding appears to be increasing, at least subjectively, in that there is an overall increase in public awareness of others' responsibility (e.g., the consumer action movement). Thus, there is an increased probability that the patient's legal awareness would act as an intervening factor causing a perceived negative medical experience to result in a malpractice claim.

IMPLICATIONS OF PATIENTS' LEGAL AWARENESS

K - A9

It would certainly be reasonable to assume that as patients become more aware of the legal responsibilities of physicians, there would be an increase in the number of patients who seek legal advice and as a result, an ultimate increase in the number of malpractice claims filed. Two correlations of variables in the Consumer Survey support this assumption. First, those patients who understood all the basic elements of medical malpractice were shown to be much more likely to consider taking legal action after once having perceived a negative medical experience. (10, p. 79) Secondly, the data in the Consumer Survey showed that exposure to the legal system is

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22/ Basically the key elements of medical malpractice are 1) negligence by the doctor, 2) damage to the patient, 3) which was proximately caused by the doctor's negligence. The sample population was divided into four categories, which in decreasing order of understanding, are: 1) those whose descriptions included the elements of negligence and damage linked by proximate cause; 2) those whose descriptions included damage whether accompanied by negligence or not, but did not include proximate cause; 3) those whose descriptions contained only the elements of negligence; 4) and those whose descriptions satisfied none of the criteria for malpractice. (10, p. 78)
positively related to the consideration of seeking legal advice and the more direct the exposure the stronger the association. (10, p. 78)

The physicians we interviewed were of the opinion that a number of years ago most patients had considerably less knowledge of the physician's legal liability. This apparent change in patient's legal awareness may have important long-term implication in the defensive medicine system.

L. PATIENT'S MEDICAL AWARENESS

Patient's medical awareness is defined as the relative amount of knowledge patients have of medicine compared to a standard of knowledge at some previous time. Most consumer data suggests that the general population has a demonstrable increase in their knowledge of medicine over the past 20 years. Some of this is due to media transmission of the excitement and fruits of medical research. However, much medical "knowledge" is related to the dissemination of information about "medical miracles" which may provide hope to patients without a legitimate basis in science. This frustration of the sick being unable to attain good health through the modern medical miracles is in part responsible, we feel, for ultimate frustrations which result in malpractice claims.

IMPLICATIONS OF INCREASED PATIENTS' MEDICAL AWARENESS

(1) \( L - W \)

The patient's medical awareness is in part responsible for increased research funding. In order to obtain federal support scientists have found it necessary to sell their products to the general public. We suggest that the more patients know about the
rewards of medical research, the more likely they are to support research funding.

(2) L- B

Patient's awareness of medicine is more likely to lead to a malpractice suit since it would increase his ability to recognize when a physician did not meet a perceived norm of medical care. As his knowledge of medicine increases, it seems reasonable to conclude that the patient's perception of what constitutes responsible medical care will increase. Thus, increased knowledge of medicine will increase the probability that the patient will perceive a negative medical experience which will result in a malpractice suit.

(3) L- A

Increased patients' medical knowledge can effect an increased capability to perceive a negative medical experience. Patients no longer believe "everything the doctor says." As the patient begins to know more about medicine, he is more able to compare his results with those of his neighbors and with what he perceives to be a standard norm of results for medical treatment. Increased patient medical awareness is undoubtedly a factor in an increased capacity to perceive a negative medical experience.

M. **PATIENTS' INSURANCE AWARENESS**

Patients' insurance awareness is defined as the patients knowledge of the doctor's liability coverage through malpractice insurance. We envision that the more patients know about their doctor's malpractice insurance the less they will be concerned that a malpractice suit will adversely affect the physician. Surprisingly,
46.6% of the interviewees in the Consumer Survey either did not
know or thought that malpractice insurance was not available to
doctors. (10, p. 17)

IMPLICATIONS OF PATIENTS' INSURANCE AWARENESS

M - B

Since the patient's concern for the physician is a primary
factor which limits the number of perceived negative medical ex-
periences which ripen into malpractice claims, the patient's
insurance awareness may be a significant intervening factor in
increasing the number of perceived negative medical experiences
which develop into malpractice claims.

N. SUCCESSFUL CLAIMS

Successful claims are defined as the number of successful
medical malpractice claims. Based on data in SCMM's Closed Claims
File Survey and the Legal Survey, it appears that during the time
frame utilized in those Surveys somewhere between 41% and 79% of
the cases filed eventually resulted in a monetary award (see section
B - N) and in 1970 this amounted to roughly 65 million dollars (see
1, pp. 19, 20). The Closed Claims Survey indicates that relatively
few successful claimants (4.2%) receive remuneration in excess of
$50,000 and less than 1 out of 1,000 successful claimants (.1%)
receive amounts in excess of $1 million. (1, p. 18) The median
recovery for successful claimants as reflected in the Closed Claims
Survey was $3,000 (1, p.18) which, as could be expected, was
similar to the median of $3,500 reported by the lawyers in the
National Survey. Equally predictable, the recovery obtained by the
malpractice specialists interviewed in the Selective Survey was significantly higher, namely, $25,000 (4, p. 209).

In February of 1973, a California jury awarded a plaintiff-patient a $4 million verdict against a hospital. This was the largest verdict ever awarded a single plaintiff in a malpractice case (or for that matter in any personal injury action). As a result of his injuries, the plaintiff is mute and paralyzed from the neck down. The Boston Globe, February 1973, p.2, c. 6.

Although we have not been able to obtain hard data on the exact number of successful claims which could have been averted by a defensive act, this does appear to be a relatively minor component of the total number of successful claims. Because of the economic criteria utilized by lawyers in screening potential cases (see section A5 - B) most of the successful malpractice claims are due to rather serious acts of negligence on the part of the physician, e.g., removing the wrong leg, leaving a surgical instrument at the time of operation, or abandoning the patient in time of need, etc. More than likely, very few, if any, of these actions could have been prevented by a defensive act. Based on our survey, we would estimate that somewhat less than 20% of malpractice awards could in any way have been forestalled by a diagnostic defensive act. Thus, the total cost of successful claims in 1970 which were in any way related to diagnostic defensive medicine probably amounted to no more than 13 million dollars while the defensive acts costs somewhat more than 1 billion dollars just in the arena of diagnostic x-ray.

N1. The Media
The media refers to Newspaper, radio, TV and specialized publications for lawyers and doctors. With the exception of people who learn of the malpractice suit through the personal involvement of themselves or their family or a friend, most people's awareness of a successful malpractice claim (or even of the filing of a malpractice claim) is based upon media dissemination of the information. The SCMM made a nationwide survey of press and periodical articles related to malpractice covering a 12-month period (September, 1971-August, 1972). The conclusion of the researcher was that the vast majority of news stories concerning that area were unemotional factual pieces which really set forth the details of claims, prosecution of cases, jury awards and verdicts. The researcher did not attempt to measure the impact of media coverage on the readers.

However, it is obvious that the media can have either a neutral, an intensifying, or a lessening effect upon the impact which any incident will have on a person's awareness and perception of the true picture. For example, even though the news media's coverage of malpractice cases may be straight-forward, the fact is that only the major recoveries such as the $4 million award referred to in Section N receive publicity. Unsuccessful claims and minor recoveries usually receive no dissemination in the popular media. This does give a distorted picture of the true situation, i.e., that most patients do not file claims against their doctor, and that most claimants if they recover at all, recover very small amounts. The $4 million California case was brought to our attention by a physician and it was evident from his comments that this type of news distribution does significantly increase physicians' awareness of the threat. Minor
claims are seldom disseminated via the media and many physicians will not readily advertise their adverse experiences even to colleagues. Consequently, the size of the claimant's recovery influences the claims about which a physician will be made aware.

Because of the media impact, in our diagrams of the malpractice system, we have channeled the effect of successful suits on physicians, lawyers and patients through a "box" representing the media.

**IMPLICATIONS OF SUCCESSFUL SUITS**

(1) \( N - I \)

By establishing judicial precedence successful malpractice suits directly affect the legal standards of care.

(2) \( N - N1 - J \)

The volume of successful suits appears to be directly related to the lawyer's interest in malpractice. When the number and magnitude of the suits increases, the lawyer's propensity for embarking upon a malpractice case is enhanced. That is, they will perceive an increased probability for a favorable settlement based on the accumulated experience of successful suits (see the discussion in I - J).

(3) \( N - N1 - K; (4) \ N - N1 - L; (5) \ N - N1 - M \)

Through the media reports of successful suits, the patient's knowledge of all aspects of the medical malpractice system (i.e., medical, legal and insurance) increases.

(6) \( N - N1 - O \)

The number of successful malpractice claims probably plays some part in the physician's awareness of the malpractice threat. However, the sheer magnitude of successful claims is probably not as
significant as is the number of claimants who receive large settlements or awards; both because of the publicity generating effect and the psychological impact of large numbers.

O. PHYSICIANS' AWARENESS OF THREAT

This is defined as a subjective impression physicians have concerning a threat. This threat has two components which are difficult to differentiate in a specific instance. One of these has to do with the perceived threat of legal liability. The second, which may be even more significant, has to do with the threat of peer admonishment. Some physicians said that they tended to do diagnostic procedures in defense of peer review even though they were not convinced the diagnostic procedure would aid the patient. Rather than risk being subjected to potential peer criticism, they would order diagnostic procedures to cover every possible source of error.

Although physicians' awareness of threat may be extremely difficult, if not impossible, to measure accurately, it seems reasonable that a physicians' attitude survey could be applied to this task. The American College of Surgeons Survey showed that some 60% of surgeons who were surveyed acknowledged that they practiced positive defensive medicine in response to a perceived legal threat (42). This indicates they are aware of a threat significant enough to alter their mode of medical practice. Even though the magnitude of this threat may be difficult to measure, it does appear that this facet of the system may be sensitive to attack, since the physician's perception of a threat may not be appropriate in relation to magnitude of malpractice risk.
IMPLICATIONS OF THREAT

O - C

The physician's awareness of the threat is a primary intervening act in his initiation of defensive practice. Physicians respond to peer pressure on standards of medical care. Similarly, the fact that malpractice claims are filed or that a successful suit has been obtained will clearly influence physicians' diagnostic activity. When interviewing physicians, we discussed the suits they had heard about and the awards made. They deemed these quite reasonable and indeed many felt that in most malpractice suits that were brought to successful fruition an act of malpractice had in fact occurred. There were, however, a number of instances where the physicians felt the jury's award of damages was inappropriate when faced with the reality of the clinical situation for which the malpractice claim was initiated. This, however, was not a dominant theme. Although, some of the suits were related to honest mistakes, the physicians observed that others were instances of gross negligence and injury. The major concern here, however, was that physicians were aware of successful malpractice actions in which they did not feel true negligence had occurred and yet the suit was successful. These instances prompted physicians to fear that anything they may do to avoid such a problem would be justified despite the cost of the individual defensive act.

P. INCREASED MEDICAL SPECIALIZATION

This is defined as the rate of the change in the percentage of doctors involved in primary care medicine. The shift of medical practice from that of the primary care physician to a medical care
specialist has been growing at an increasingly rapid rate over the past twenty years. Currently some 16% of total physicians are involved in traditional primary care medicine, i.e., general practice, while some 20% are involved in internal medicine practice in which they play the role of the primary physician (51). Admittedly other physicians also do primary care but the overall percentage has significantly decreased in the past twenty years. In 1955 over fifty percent of total physicians were involved in general practice alone. We can observe the more recent trends by appreciating that in 1965 there were 66,400 general practitioners in office practice in the United States and this number decreased to 54,700 by 1969 (51). Whereas the number of full-time primary specialty physicians in office-based practice in 1965 was 119,000, this increased to 129,700 by 1969 (51). Thus, despite the increase in total physicians from 305,100 in 1965 to 338,400 in 1969, the percentage of general practitioners decreased from 22% in 1965 to 16% in 1969.

IMPLICATIONS OF INCREASED MEDICAL SPECIALIZATION

P - G

Increased medical specialization is considered as a primary factor in decreasing patient rapport. The Consumer Survey suggests that patients no longer feel that physicians are primarily interested in their total welfare but are becoming increasingly interested in a specific disease or organ system of the patient (10, pp. 21-27). "This diminution of the "bedside medicine" concept as perceived by patients tends to cause dissonance in the physician-patient relationship particularly when faced with the historic precedent and childhood memories of
the physician being a close supporter in time of need almost to the extent of being deemed a "member of the family". This concept is still a dominant influence in doctor-patient relations as is evidenced by the fact that in the Consumer Survey most patients did not initiate malpractice suits even when they perceived a negative medical experience. However, when the patient perceives that increased medical specialization has resulted in a more cold and remote physician, this diminished patient rapport may ultimately be a significant factor in the increased amount of malpractice claims filed.

Q. **DECREASED DEDICATION TO WORK (BY EVERYONE)**

This is defined as the perceived social change which advocates increased leisure activities at the expense of productive work effort. Although we have not been able to obtain quantifiable data that would suggest this is true in the field of medical practice, the fact that this is perceived is shown in the Consumer Survey (10, p. 24). The consumers did not perceive the overall decrease in dedication to work to be more evident in physicians than in other members of society, but this trend, they felt, was a responsible factor for the increase in malpractice claims. Since this perception may not be consistent with the facts, it seems that additional information in this area may serve as a sensitive attribute of the system to initiate change. If it could be demonstrated that physicians now work as many hours as they did in the historic past, this perception may diminish. Once the hours worked were established, it may also be possible to show that even if physicians now work fewer hours, the productivity per unit of work has increased in medicine as it has in most areas of industry.
IMPLICATIONS OF DECREASED DEDICATION TO WORK

(1) Q - A

The fact that consumers perceive a decreased dedication to work is likely to increase their perception of a negative medical experience. Adverse results may be perceived by the patient as due to negligence even though it may not be; since the patient perceives that physicians, as well as other members of society, are not as dedicated to their work as they "used to be."

(2) Q - G

The consumer's perception of a decreased dedication to work has an effect in diminishing patient rapport. That is, the consumer infers that the physician is somewhat more careless than he "used to be" and some patients manifest this inference by alleging they can no longer "trust the doctor." Since medical care is based primarily on a relationship of trust between the physician and the patient; dissonance manifested by lack of a patient's confidence that the physician is primarily interested in him will result in the decreased patient rapport.

(3) Q - P

The Consumer Survey suggests that patients' perceived decreased dedication to work on the part of physicians is in part related to their assessment of the physicians' motivations for medical specialization. Many patients seem to feel that physicians specialize because specialists do not have to work as hard as the primary care physician and thus have more opportunity to enjoy the luxuries generated by his activities. The physicians we interviewed tended to deny this as a
specific component of increased medical specialization, but the reason for their denials were quite obvious. Whether or not this is indeed a reality in the system is still open to question. It is reasonable to conclude that some medical specialists become specialists because they would not like to work as hard as primary care physicians; however, for many, probably most medical specialists, there is no good evidence that specialization decreased the total amount of work demanded by their careers. That is, most medical specialties require that the specialist be available to respond to the needs of the primary care physician referring them patients, or to the needs of the patient at all hours of the day and night.

R. GOVERNMENT HEALTH INSURANCE

This is defined as the change in primary government funding for medical services. It appears that the availability of government insurance under such programs as Medicare 22a/ has significantly increased the total percentage of the population seeking medical care. Since 1954, when the Eisenhower Commission concluded that medical care was a human right and no longer a privilege, there has been an increasing opinion that the public's demands for medical care should be met through the use of public funds. Though this was not included in our initial model, we became aware of the significance of this factor in the data accumulated by the SCMM. They observed some implications of Medicare funding not evident to us in our initial analysis of the system, e.g., the affect of government bureaucracy.

This may become an increasing attribute of the system in view of the impending further increase in federal support of health care, i.e., National Health Insurance.

**IMPLICATIONS OF GOVERNMENT HEALTH CARE FUNDING**

(1) **R - A5**

The presence of health insurance, whether government or privately sponsored, will decrease the economic motivation for considering legal action. As discussed in section A5 - A8 a substantial aspect of the economic motivation is the extra expenditure for medical expenses resulting from the perceived negative medical experience. The health insurance would not affect the economic motivation resulting from lost wages or from the other extra non-medical expenses caused by the unsatisfactory medical care, but the percentage of interviewees who voiced this as a motivating factor for considering legal action were 40% less than the number who were motivated by increased medical expenses. Likewise, the presence of medical insurance will have no effect on the revenge or non-economic motivating factor, but as discussed in A6 - B, it is very unlikely that a lawyer would file a malpractice case for non-economic reasons.

(2) **R - A7**

Obviously if the patient's medical care is covered by some type of insurance plan, the physician will have no necessity to bill the patient. Thus, this eliminates a source of patient irritation which finds expression in the consideration of legal recourse.

(3) **R - F**

The availability of government medical insurance to patients
who would otherwise not be seeking health care for fear of its cost has undoubtedly contributed to the cost of health care in general. Indeed the percent of the Gross National Product consumed by National health care expenditures has risen from 4.6% in 1950 to 7% in 1970 (54). And when considering just personal health care expenditures, the public proportion of this has increased from 19.9% in 1950 to 35.3% in 1970 (54). This can be more clearly seen when one appreciates that in 1950 there were 3 billion dollars spent by the government in health care which increased to 9.5 billion dollars in 1965 and 24.9 billion in 1970. (54).

(4) \( R - G \)

The SCMM found that the lack of adequate communication as to the rights and restrictions of the Medicare program and the bureaucratic red tape caused tensions and frustrations in the Medicare patient which played a significant role in increasing his animosity toward the health care system which resulted in a decrease in doctor-patient rapport and thereby fostered a fertile environment for malpractice claims. If one wished to change the system, this is a potentially sensitive area since increased communication regarding the prerogatives of the patient who is receiving government support for his health care would tend to diminish the misinformation responsible for the animosity on the part of the Medicare patient.

We do not conclude that the effect of Medicare on patient rapport is all negative; since undoubtedly federal support for health care has resulted in the availability of some services to patients
which would not otherwise be possible. Thus, there must also be a favorable component to this relationship.

(5) \[ R - W \]

Increased government medical insurance seems to have an effect on the research funding. The specific effect is somewhat controversial. Many feel that the availability of federal monies to the health care system should tend to increase the amount of monies available for research funding but it appears the opposite effect has prevailed. The federal health budget has been consumed so much by primary care that there is less money available for research funding. The current decrease in research monies, or at least a plateau in available funds for research, is in part related to the increased consumption of federal monies for primary health insurance.

S. **DIAGNOSTIC EFFICACY**

Diagnostic efficacy is defined as the beneficial effect of a diagnostic procedure on the course of a disease. This can be measured in the degree of change from random variation in the "natural history" of the disease. This concept of efficacy can be construed as a subsystem whereby diagnostic information leads to diagnostic utility which leads to diagnostic efficacy. Diagnostic information is defined as the information content of a diagnostic attribute, that is, the amount of additional information to be obtained by the addition of an attribute, i.e., sign or symptom of disease. This can be measured in the degree of change in the state of knowledge (a change in entropy). Diagnostic utility is defined as the effect of a diagnostic procedure on what a physician does for a patient. This is measured in the degree of
change from the physician's behavior without this information. Thus, to be efficacious, a diagnostic procedure would include both information and utility.

This attribute of the entire system is particularly prone to further investigation and if it were effectively quantified, could clarify the magnitude of diagnostic procedures ordered that are not due to efficacy. Because of its importance to the system and the fact that it may represent a particularly sensitive area for further investigation, we will discuss the subsystem in some detail later in this thesis.

**IMPLICATIONS OF DIAGNOSTIC EFFICACY**

**S - D**

The cardinal basis that most physicians will ascribe to their specific ordering of any diagnostic procedure is its diagnostic efficacy. While we recognize this is dominant in any single case, most physicians appreciate that it is not the only motivational force.

**T. NEW PROCEDURES (INNOVATION, CURIOSITY, HABIT)**

New procedures can be defined as the change in the number of available diagnostic techniques which could potentially be used to aid in the understanding of disease or its management. This could be measured as the percentage of total diagnostic procedures available in which there is no established diagnostic efficacy.

**IMPLICATIONS OF NEW PROCEDURES**

**T - D**

Many new procedures are used because they are available,
exciting, and innovative, thus stimulating the physician's curiosity as to their potential utility in a specific clinical situation. In radiology or in any area where developing new laboratory tests are a significant feature, a major factor affecting use is that the physician on becoming aware of the procedure considers that it may be important in the care of his patient. He thus tends to apply it to patient care without having firmly established that it is indeed efficacious. All too frequently, new procedures are applied for a duration of time which far exceeds the potential testing of their diagnostic efficacy. Many physicians seem to practice with the idea that "I think this procedure might help this patient because it may have helped the previous patient," even though they do not have clear evidence that this position is indeed true. The measurement of the total number of x-rays ordered that are due to the physician's curiosity in using new procedures is very difficult and perhaps can best be done by a clearer understanding of diagnostic efficacy. We could then determine whether those procedures which are not efficacious are used either on the basis of innovation, curiosity, habit or defense.

(2) \[ T - S \]

Some new procedures ultimately become diagnostically efficacious. A further discussion of this interrelationship will be relegated to the discussion of this subsystem later in the thesis.

U. THE AVAILABILITY OF DIAGNOSTIC PROCEDURES

The availability of diagnostic procedures can be defined as the total number of procedures available to physicians in their locality.
While most physicians do not have available to them the entire gamut of all diagnostic x-ray procedures, there is a general tendency to make available those procedures which physicians in other localities conclude have been useful in patient care.

IMPLICATIONS OF THE AVAILABILITY OF DIAGNOSTIC PROCEDURES

U - D

   Obviously the availability of procedures is an essential prerequisite to them being ordered. No matter what the motivational forces are behind their use, if they are not available to the physician he cannot order them.

V.   TREND FOR NO-FAULT INSURANCE

   The trend for no-fault insurance is defined as the total amount of insurance in the personal injury area which is on a no-fault basis and can be expressed as the percentage of total insurance in the no-fault arena. We became aware of the possible effect of no-fault auto insurance on the medical malpractice system in our discussions with insurance company representatives.

IMPLICATIONS OF NO-FAULT INSURANCE

V - J

   Insurance company personnel whom we interviewed in Massachusetts, clearly felt that one factor responsible for the increase of malpractice suits in Massachusetts was the diminution of business experienced by personal injury lawyers after the enactment of no-fault auto insurance in Massachusetts. 23/ They believed

23/ In the past two years, nine other states have revised their insurance laws to encompass some aspect of no-fault coverage. Congressional Weekly Report, pages 1530-1(1972).
that this necessitated those lawyers seeking other sources of income and since their expertise was in the medically involved personal injury area, it appeared to the insurance company personnel that these lawyers have turned their attention to such problems as medical malpractice.

While we have not been able to obtain hard data on a comparative assessment of the rate of change in malpractice claims in areas where there is no-fault insurance compared with a control area where no-fault auto insurance has not been enacted, it is the subjective impression of the people in both Massachusetts and California that this is a significant factor in the system. It is certainly reasonable to assume that lawyers who handle both malpractice and personal injury cases would have more time and a reduced income by virtue of the reduction in personal injury business which resulted from the enactment of no-fault automobile insurance laws. These factors might lead the lawyers to a greater interest in stimulating new malpractice business in their social contacts (see Section J1--A9) and also might lead them to accept marginal malpractice cases which they would not otherwise have taken. 24/ This would also be true for those personal injury lawyers who did not normally handle malpractice cases except that they might be much more prone to take on the marginal case because of their lack of expertise in that area.

24/ Lawyers questioned in the Legal Survey indicated that in 13% of the cases brought to them, the patients had been turned down by other lawyers and were therefore "shopping around" for lawyers to take their cases. (3, p. 205)
If the no-fault trend is extended to medical malpractice cases, it could decrease lawyers' interest, while at the same time it might also decrease doctors' defensiveness since it would eliminate the stigma of fault and also eliminate or lessen (depending on the provisions of the no-fault system) malpractice claims.

W. RESEARCH FUNDING

Research funding is defined as the total money available for medical research. It can be measured as the total monies available or the rate of change in funding. Although there is a current trend of leveling off of total funds available for medical research, the growth of the research effort can be appreciated by recognizing that the research component of National health care expenditures increased from 0.9% in 1950 to approximately 2.8% in 1970. This resulted in a dollar increase from $110 million in 1950 to $1.8 billion in 1970 (54). While some of this research money has come from private expenditures (the amount of private expenditures for medical research increased from 37 million dollars in 1950 to 195 million dollars in 1970) the federal component has been far more significant (54). Federal medical research monies increased from $73 million in 1950 to $1,695 billion in 1970 (54).

IMPLICATIONS OF RESEARCH FUNDING

(1) W - P

Increased research funding has effected an increase in medical specialization by giving support to physicians for medical research in their areas of special interest and withdrawing them from the primary practice of medicine. The number of physicians
engaged in professional activity other than patient care increased from 15,500 in 1965 to 26,000 in 1969. That is, there was an increase in the distribution of physicians from 5% engaged in non-patient care professional activity in 1965 to 8% engaged in such activity in 1969 (51). While research does not represent all of the nonpatient care professional activity, research undoubtedly plays a significant part in this trend.

(2) W - H

Research funding is the dominant feature responsible for the growth of medical knowledge. Through this mechanism, increased research funding may have an effect on the number of malpractice claims filed.

(3) W - U

Research funding is largely responsible for the availability of procedures, particularly those that are new and innovative. Many procedures that are developed and become available as diagnostically efficacious in the academic health center, are initiated and made available through research monies.

X. MEDICAL STANDARDS OF CARE

Medical standards of care are defined as the norm of medical care as perceived by the physician. These standards are not universally held or well defined. Most represent a reasonable norm of what a physician may be expected to do for a patient. However, the genesis of these norms and their habitual application has not been studied with sufficient clarity to warrant an attempt to estimate quantitatively their rate of change.
One scenario for the genesis of these standards may run as follows. A physician may become aware of a diagnostic procedure when told by a colleague that it has helped in a specific patient's problem. He may then feel that if he doesn't use it when faced with a similar clinical problem, he would not "be doing everything he could for the patient." Once used, the application of the procedure may become habitual even though the physician finds it only occasionally or even rarely useful. Thus, the mere presence of new procedures may tend to increase the number of defensive acts via this mechanism.

**IMPLICATIONS OF MEDICAL STANDARDS**

**X - Y**

Medical standards or norms of practice form the basis for peer review, i.e., physicians can be expected to be held by their peers to a standard of practice which is considered normal.

**Y. PEER REVIEW**

Peer review is defined as the objective and subjective peer pressure used to maintain a standard of care. Traditionally, physicians have been held to a peer standard of approval for their medical activities. While most of this peer pressure was informal; the activities of tissue committees, medical practice committees and ethics committees were in vogue even before the enactment of Medicare legislation which required hospital utilization committees. Many feel that the advent of hospital utilization committees is largely responsible for the progressive decline in duration of hospital stay per patient admitted. Recently, with the enactment of HR1, professional
standards review organizations are being established. These can be anticipated to have an even greater impact on objective peer review.

**IMPLICATIONS OF PEER REVIEW**

Y - O

Peer pressure, both objective and subjective, represents a primary motivating force for a physician to maintain a quality practice of medicine. The presence of objective peer review committees, especially when required by law, is perceived as a threat to many but not all of the physicians we interviewed.
CHAPTER III  

DISCUSSION

A systems analysis of the social process in which we find defensive medicine suggests that the very practice of defensive medicine may in part be responsible for its increase. We will, therefore, attempt to describe in some detail the core of the system in an effort to elucidate the feedback loop and to identify those areas where further research could clarify the interrelationships with sufficient insight to diminish the significance of this feedback system. We intend, by looking at the core of the system, to identify those areas most sensitive to change and further research.

THE CORE OF THE SYSTEM

The simplified system presented in Fig. 1 (p. 94) shows the relationship between malpractice claims, defensive acts and their results in both the medical and legal arenas. These medical and legal implications we perceive as the backbone of the feedback loop which increases the number of malpractice claims filed. In the physicians we interviewed there was a total lack of awareness that such a feedback would exist and many felt it was counterintuitive. When looking at the core of the system it becomes apparent to us that the reality of these feedback loops have sufficiently high probability to warrant their further elucidation and the eventual dissemination of this knowledge.

The use of systems analysis techniques to elucidate counterintuitive principles in social behavior have been applied by previous investigators (Forrester, etc.) in areas of urban problems and more
recently in looking at the problem of world dynamics and limits to
growth. 25/ It should, therefore, not be at all surprising that we
have identified some of counterintuitive principles in this social
system of defensive medicine. Admittedly, an individual act of
defensive medicine in this system may well not increase the legal
hazard that a specific physician faces in his practice; however, the
aggregate of defensive medicine activity represents a significant
factor in increasing the total threat. Thus, the distinction between
what an individual physician perceives as the impact of his defensive
act and its probability of increasing malpractice claims suggest
that he may be particularly reticent to change his behavior without
very firm evidence on the implications his defensive act has on his
liability. Thus, it is important to differentiate the individual per-
ception of his need for a defensive act from the aggregate effects
of these perceptions on the system. With these points in mind, it
seems reasonable to make an effort to appreciate the relative
strengths and weaknesses of our contentions, i.e., defensive medicine
is a process which feeds back upon itself. In this regard, we should
clarify our prejudice that the consumption of resources for health
care which are not designed to benefit the patient is out of proportion
to the real threat of a malpractice claim, and thus, represents an
inappropriate application of resources to patient management.

The specific attributes of this system which deserve attention
are those where the interrelationship between attributes are either

25/ See, Forrester, Jay, World Dynamics, The M.I.T. Press ( );
Meadows, Dennis L., William W. Behrens III, Donella H. Meadows,
less clearly defined, amenable to quantitative research, or parti-
cularly sensitive to change. The relationship between a malpractice
claim and the defensive act seems rather firm (see Fig. 2, p. 97).
No physician whom we interviewed felt that defensive acts were based
on other than what they perceived as a potential threat. We conclude
this is a strong portion of the system, and if we could clearly estab-
lish the feedback loop shown in Fig. 1 (p. 94) and disseminate this
information to physicians, the system may be sensitive to change.
The physician should recognize that the behavior (defensive act) is in-
appropriate when compared to the magnitude of the malpractice threat.
Thus, the physician's awareness of a threat may be a most sensitive
area to better inform physicians, not only as to true magnitude of
the threat, but as to what effect their actions have upon it.

When we attempted to find out why physicians were worried
about malpractice, since it does not seem to be a significant per-
sonal financial burden in view of the widespread utilization of mal-
practice insurance, we became aware that the primary reason for
their concern was one of self-image. Physicians do not like to be
questioned by patients or other physicians; they do not like to have
others recognize the limits of their medical capabilities. This sub-
jective impression may be difficult to counteract. Using a Lewin
force field analysis to look for sensitive areas of change in this
attribute, it seems that it would be most appropriate to clearly
elucidate if the physician's response was inappropriate to the
stimulus. If we could adequately defend and disseminate our con-
tention that the cost of defensive acts exceeds 1 billion dollars
Figure 2
The Relationship between Defensive Acts and Malpractice Claims
while the total malpractice liability for which defensive acts may have potentially diminished liability is somewhat under 15 million dollars, this cost-benefit ratio of greater than 65 to 1 may alone be sufficient information when recognized by the practicing physician to change his behavior.

The indirect feedback shown in figure 1 whereby defensive acts increase the malpractice threats by increasing the cost of medical care is somewhat weaker than the direct relationship between malpractice claims and defensive acts. Despite this, our data suggests that patients who perceive they have a human right to health care, feel an increased animosity at the cost of this care. From our data, diminished patient rapport is an absolute prerequisite to a malpractice claim. Most patients who perceived that they had a negative medical experience did not initiate a malpractice claim because of good doctor-patient rapport and a prime motivational factor for those patients who did initiate such a claim was their lack of rapport with their physician. Thus, the relationship between cost of health care and diminished patient rapport with the increase in malpractice claims seems to be clear (see Fig. 3, p. 99). Thus, although the feedback loop may be counterintuitive, each individual segment appears reasonable. The exact magnitude of these attributes, however, cannot be as reliably ascertained as can the direct portion of the system going from a patient's perceived negative medical experience to a defensive act.

The feedback loop from x-rays ordered through standards of medical care to peer review (see Fig. 4, p.100) is ever firmer
Figure 3
The Relationship between Cost of Health Care and Diminished Patient Rapport
Figure 4
The Relationship of X-rays Ordered to Standards of Care, to Peer Review
than the loop through cost of care to malpractice claims. Our data tends to confirm the general impression that physicians are concerned about standards of care and peer review. Unfortunately, standards of medical care are not always based upon diagnostic efficacy; in fact, most physicians would say "diagnostic efficacy can't be measured." Perceived diagnostic standards don't tend to take into consideration the motivational force forming the genesis of the standard. Once a standard is established, physicians don't continually seek to find out if the standard is based on efficacy, habit or defense. Standards, once set, tend to be inflexible. These points emphasize the need to clarify the motivational force behind a diagnostic standard. A reasonable attack on this problem would be to develop a means to measure diagnostic efficacy.

The legal feedback loop (see Fig. 5A, p.102) shows that defensive acts increase legal standards of care resulting in an increased malpractice threat (see Fig. 5b, p.103). However, legal standards of care are based upon what is done by physicians without a distinction being drawn between efficacious diagnostic procedures and diagnostic procedures done for purposes of defense. Consequently, absent cogent proof to the contrary, insofar as the law is concerned, the diagnostic procedures routinely undertaken by a doctor and his colleagues are presumably performed for reasons of efficacy. Failure to utilize them might well be considered negligence, i.e., failure to comply with the standards of a reasonable man.

The relationship between higher legal standards of care and an increase in malpractice claims filed seems most reasonable in
Figure 5a  Basic Factors in the Legal Sub-System
Figure 5b
The Relationship of Defensive Acts to Increased Legal Standards
that raising the standards against which a physician's actions are measured increases the probability that those actions will not meet the standard and that a lawyer evaluating a patient's case will accept it and file a claim.

When the system is looked at on an aggregate basis, similar to what we have done above, it becomes apparent that this model has sufficient credibility to warrant its recognition. This may serve to stimulate further research efforts both to clarify and more accurately quantify its components and to identify areas which are sensitive to change. Prior to embarking on an analysis of future areas for research into the system, it seems reasonable to look at the aggregate system in terms of its long term effect.

**LONG TERM EFFECTS**

As with any positive feedback system (i.e., one which tends to feed upon itself) this system of defensive medicine suggests that defensive acts themselves are enhancing the incidence of malpractice claims (see Fig. 2). Once malpractice claims are initiated on grounds not related to a defensive act, this positive feedback effect results in an increase in the number of defensive acts which increases cost, decreases patient rapport, raises legal standards and ultimately results in an increase in the number of malpractice claims. Thus, one could envision a system which, when once primed with the truly negligent act that results in a perceived negative experience, could be preserved and indeed, increase over time the incidence of defensive acts even though there were no further negligence in the practice of medicine. We do not mean to infer that negligence does not occur.
for it does. But, each act of negligence which primes the system effectively results in a remarkable increase in defensive acts out of proportion to the initial priming because of the positive nature of the system of defensive medicine.

The fact that defensive acts are of such greater dollar magnitude than the amount paid as a result of malpractice claims suggest that positive feedback indeed is occurring. Unless some means can be devised to alter the system now in existence, it is apparent that defensive acts will continue to increase. These defensive acts will result in an increasing misallocation of resources away from a primary concern for aiding sick people to an increasing concern to protect physicians. This fact alone amply demonstrates the need for further efforts to clarify the system and to identify sensitive points for potential change.

In attempting to understand the long-term trends, it becomes apparent that there are many sensitive areas to effect change which are not necessarily located within the core of the system. Some of the external sources to this core could be significantly altered and thereby, diminish the magnitude of the positive feedback loop. For example, even a clear recognition by patients that a tendency for decreased dedication to work by physicians is not valid could beneficially diminish the magnitude of the feedback. Or, a trend which would decrease medical specialization and increase primary health care physicians could also diminish the magnitude of the feedback loop. Finally, in the medical implication, one of the primary influences on the system is the growth of medical knowledge;
although it does not seem reasonable to suggest that decreased rate in the growth of medical knowledge should be sought as a means to diminish the system, it does suggest that appropriate communication of the system and the effect of medical knowledge could diminish the influence that increased medical knowledge has on the overall system of medical malpractice.

The long-term effect of increasing legal standards where these standards do not clearly differentiate between efficacious and defensive diagnostic acts would result in increasing the practice of defensive medicine on this ground alone. It would therefore, seem appropriate to differentiate clearly the motivation that physicians have for diagnostic acts if at all possible.

Based on our discussions with the Bureau of Radiological Health, we conclude that it is possible that the inappropriate application of resources, i.e., unnecessary examinations (especially radiologic examinations) which may subject the patient to increased cost and risk but which are not designed primarily to help the patient, may itself be malpractice. Thus, an awareness by the legal profession of the motivation doctors have for using diagnostic procedures may well change the system. We have found no case where a suit was premised on the contention that a diagnostic procedure was used to protect the physician and not to help the patient and that therefore the physician was negligent, i.e., breached a duty of care owed to his patient. But there have been suits where the alleged negligence of the physician was his action in unnecessarily
exposing the patient to radiation from excessive or unneeded x-rays. (Louisell and Williams (44) §§2.10, 2.15, 4.12 and cases cited therein.) It does seem reasonable to suppose that if physicians were successfully sued for damage caused by unnecessary diagnostic procedures, it could result in a significant decrease in the utilization of those procedures for that purpose.

Absent a legal development along those lines, the long-term effect of this current model has undesirable implications. The practice of defensive medicine will increase out of proportion to the increase in physician negligence or the perception of a negative medical experience. Some components of the system are particularly sensitive to further research that may result in sufficient clarification to alter these long-term implications. We will, therefore, now develop in some greater depth areas where further research efforts may provide additional information necessary to change the system.

A STRATEGY TO CHANGE THE SYSTEM OF DEFENSIVE MEDICINE

While defensive medical acts consume considerable resources in patient care, the exact amount of this resource consumption is obviously extremely difficult to ascertain. The physicians we interviewed recognized many components of positive defensive acts (e.g.,

26/ Of particular significance are two cases cited in §4.12 which involved the utilization of x-rays that were ultimately found to be unnecessary: Wilder v. Haworth, 187 Ore. 688, 213 P. 2d 797 (1950); plaintiff alleged she suffered injury after defendant treated a presumed uterine tumor, later found not to exist, with x-rays; Stemmer v. Klein, 19 N.J. misc. 15, 17 A.2d 58 rev'd, 128 N.J.L. 455, 26 A.2d 489 (1941); plaintiff given x-ray therapy to the abdomen on the basis of a mistaken diagnosis--later gave birth to deformed child.
increased consultations, increased laboratory tests, increased x-rays ordered, etc.). Most felt that the potential for obtaining quantitative data could best be met by further elucidation of the motivational factors that influence the use of radiology. This does not mean that consumption of resources through x-ray use is the dominant factor in defensive medicine, but other resource consumption for defensive purposes is less easily measured than is the use of x-rays. We will, therefore, attempt to analyze the dynamic system in which we find the use of diagnostic x-rays. Through analysis of this subsegment of our entire system we have been able to evolve a strategy for further research effort which may shed light on the quantity of diagnostic x-rays used for defensive purposes.

Even though we may better understand the system which motivates physicians to use x-rays, one could probably question; "What could be done about it?" Obviously, the answer is, we don't really know until we can study it further, but it does seem to be a reasonable focal point for clarification and analysis. If the system affecting the use of diagnostic x-rays was measured and understood, it seems reasonable that it may be changed if clearly demonstrated to be inappropriate.

**A SYSTEM OF MOTIVATIONAL FACTORS EFFECTING THE USE OF DIAGNOSTIC X-RAY: A SUBSYSTEM OF MEDICAL IMPLICATIONS OF DEFENSIVE MEDICINE**

Figure 6 (p.109) presents a subsystem of motivational factors which effect the physician's use of diagnostic x-ray. The defensive acts have been described in some detail above and as we have said,
it is extremely difficult for us to measure the exact quantity of medical resources consumed in this manner. Physician respondents varied in their opinion as to how much of total x-ray use is due to defensive acts (ranging from 22-71%). As we stated above, it appears reasonable to estimate that at least 30% of total diagnostic x-ray use is for defensive purposes, but in any one individual patient this does not necessarily mean that the entire motivation behind the use of the x-ray is for defense, but rather that defensive acts contribute to the choice of an x-ray as an alternative diagnostic step where the diagnostic efficacy may be less then that for another procedure. For example, in an individual patient, the physician may be faced with choosing between the use of an x-ray to obtain diagnostic information versus the use of another laboratory procedure which may be less expensive. He may select the x-ray because of an additional motivational component related to his fear of a malpractice action. Admittedly, some, perhaps even most, x-rays motivated by defensive acts are entirely defensive in nature, but it does seem reasonable however to point out that in any individual patient more than one motivational attribute may be present. As previously discussed (section C - D), hard data concerning the magnitude of the defensive practice varies from the Duke University Law Study where approximately 22% of the physicians acknowledged the use of defensive x-rays (42) to the American Medical Association's study in which 71% of the physicians surveyed said they used x-rays or other diagnostic procedures for defensive purposes (41a).

Figure 7 (p. 111) taken from a thesis by Schönbein and Potchen
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Figure 7 (p. 111) taken from a thesis by Schonbein and Potchen
Figure 6
Motivational Factors Which Affect the Physician's Use of Diagnostic X-rays
Figure 7
Hypothetical Distribution of Defensive Practices in Different Clinical Settings
represents a hypothetical distribution of the total magnitude of defensive practice in different clinical settings. It seems reasonable to suggest that in an urban emergency room where patient rapport is minimal, there would be an increased use of defensive medicine while in a university hospital, defensive medicine would more nearly approach the average. Here too, the problem of increased medical specialization in the university hospital when compared to the community hospital inpatient care facility suggests that more defensive acts would prevail in an academic medical center than in a community hospital. This hypothetical distribution of motivations behind the use of x-rays also shows that there would perhaps be less innovation and curiosity prevailing in a busy urban emergency room than there would be in a university hospital.

The innovation, curiosity, habit motivational system behind the use of x-rays is also not easily measured. Schonbein and Potchen (45a) have developed a model (Fig. 8, p. 113) for innovative application of new procedures which suggest that these motivational attributes alone may be sufficient to maintain a high level of x-ray utilization despite the fact that the procedures may never reach the status of diagnostic efficacy.

In this model it can be seen that an available new procedure will be used by the clinician out of curiosity and innovation for a period of time until its use is not seen to be efficacious. Once this is recognized by a population of physicians, the use of this procedure
Figure 8
Use of a "New" Diagnostic Procedure
will diminish over time but may never really approach a zero use because the physicians who initially "invented" the procedure may be particularly reticent to abandon it as not efficacious and other physicians have gotten into the "habit" of using the procedure. It is entirely possible that when one procedure is abandoned--because it is not demonstrably efficacious--another new procedure could be developed which would go through the same life cycle. This is particularly true in such a rapidly growing area of medicine as diagnostic radiology and nuclear medicine. Thus, one could envision that innovation and curiosity alone could sustain a medical discipline over a period of time without ever having to demonstrate that the new procedures were useful to help sick patients (see Fig. 9, p. 115, Line A). The fact that this system might be reasonable does not really help much in attempting to quantify the relative magnitude of its effect as a motivational force behind the use of diagnostic x-ray.

Let us then turn to an area where a strategy is being developed which may allow for quantitative appreciation of a single motivational force, i.e., diagnostic efficacy. If one could clearly measure the diagnostic efficacy of an x-ray procedure, one could then justifiably infer that procedures which were not efficacious are being performed on the basis of innovation, curiosity, habit, or on the basis of defensive acts. This seems to be a reasonable starting point to develop a quantitative appreciation of the magnitude of the medical
Figure 9
Serial Use of "New" Diagnostic Procedures
implications of defensive medicine. Previous studies into the clinical judgment of physicians have been primarily based on Bayesign approach to statistics. Here a priori information is accumulated, the procedure performed, and the results analyzed. The major limitation to a standard Bayesign approach to define diagnostic efficacy is the fact that patients vary considerably in the sequence of a priori attributes which they present to the physician. It is thus very difficult to get a statistically significant population of patients with exactly the same prior sequence of symptoms and signs such that one can ascertain the relative efficacy of a diagnostic procedure at any moment in the course of a patient's illness.

Recent studies employing the concept of multi attribute analysis by detecting patterns of correlation in n-dimensional space (developed by Peterson) suggest that it may be quite possible to ascertain the potential utility of a diagnostic x-ray. This procedure entails detecting patterns of minimal entropy in an n-dimensional space constructed of patient attributes which the physician faces at the moment of a diagnostic decision. Schoenbein has shown that this technique is feasible to categorize and correlate potential information in various aggregates of diagnostic attributes seen in patients presented to emergency rooms who subsequently underwent skull x-ray. (45a) Once the information content of a diagnostic attribute aggregation is clearly appreciated, it is equally feasible to do a similar attribute analysis to appreciate a pattern in a physician's behavior when faced with any complex of symptoms and signs. By then ascertaining the correlation between the diagnostic
attributes and the attributes of physician's behavior one could ascertain the utility of x-rays in each instance. That is, the effect the ex-rays had on a physician's behavior should become quite clear and thus one could measure diagnostic utility as a degree of change from the physician's behavior without the additional information contained in the x-rays. Diagnostic utility alone may be a significant compelling force to motivate the use of x-rays. However, the rational physician will suggest that diagnostic utility which does not result in diagnostic efficacy will not be a sufficient force for his continued application of the procedure.

Diagnostic efficacy could, therefore, be ascertained for any diagnostic procedure from a similar multi attribute analysis relating physician's behavior to the outcome of the disease process. It seems feasible to begin a series of studies directed toward quantifying diagnostic efficacy which then could be measured as a motivational force behind the use of x-rays. It is fair to presume, that most physicians feel they use x-rays now for diagnostic efficacy, but none of them are capable of quantifying the relative merits of alternative diagnostic procedures. Admittedly, many procedures are now used under the guise of efficacy which may be related to misinformation on the part of the physician, in that there has been no previous system designed which would allow him to be entirely aware of the relative information content of a potential x-ray in a specific clinical situation. Obviously, were this information available to physicians, continued use of diagnostic procedures for other reasons than efficacy could be more clearly defined.
CHAPTER IV

CONCLUSIONS

We have described the social system in which we find defensive medicine and have attempted to elucidate some of its interactions and their relative validity which forms the basis for our perception of this system. We feel that there is a failure by physicians to recognize the implications of the defensive act as a positive feedback system in which defensive acts increase the physician's malpractice threat. This positive feedback system may be a significant factor in the continued increase of defensive medicine and the inappropriate allocation of health care resources which result therefrom, i.e., defensive acts are not designed to help the patient, but rather to protect the physician from liability. Our preliminary analysis reveals that the cost of defensive medicine in the added use of diagnostic x-rays alone represents a cost benefit ratio of greater than 65 to 1, i.e., greater than 1 billion dollars cost for less than 15 million dollars of liability which could be affected by defensive acts.

Although further confirmatory data and subsequent experiments are necessary to support the system, the overall theme seems quite reasonable. The recognition of this system thus may have significant impact on the ultimate allocation of health care resources since by the positive nature of the system, its continued use will continue to increase the cost of defensive medicine. We recognize the limitations of quantifiable data for some of the system's attributes, but these limitations should not preclude disseminating our model in an effort to stimulate further research and interest in the system of defensive medicine such that ultimate changes may become possible.

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We therefore recommend:

1. That the principles evoked in this system analysis be disseminated to the medical profession with two primary goals:
   a) to simulate interest in the systems analysis approach to complex social systems which have not been adequately studied in health care problems;
   b) to point out if possible inappropriate behavior by physicians in responding to a threat out of proportion to the magnitude of the threat.

2. It is apparent from our preliminary appreciation of the system in which we find defensive medicine, that further research is needed on specific areas. This research effort could be used not only to verify the system and support or refute our initial precepts, but may also be useful to point out the most sensitive areas whereby the detrimental attributes of the system could be changed. We recommend that there be increasing emphasis on the motivational aspects affecting the use of radiology as one component for further study. We also recommend further research to identify the legal implications of defensive medicine designed to seek alternative legal approaches and to clarify legal standards of health care. In this regard it would seem reasonable to disseminate to the legal profession a documentation of the distinction between defensive and efficacious diagnostic motivation.

3. Physicians should be advised that their refusal to testify or consult with lawyers in medical malpractice cases could initially impede the filing of malpractice claims. However, this probably
results in diminished patient rapport and the ultimate creation of some judicial doctrine such as res ipsa loquitur to remedy the situation caused by the lack of physician cooperation. One impediment to lawyer-doctor cooperation might be caused by physicians misconceptions regarding the contingent fee system. Consequently, doctors should be apprised of the fact that the contingent fee is not the root cause of the malpractice problem. Not only does it not encourage lawyers to bring non-meritorious claims, but it probably results in a greater screening of such cases than would a fee for service system. Moreover, lawyers operating under a contingent fee system are not earning unconscionable fees.
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PERSONAL INTERVIEWS

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GROUP PRESENTATIONS

Group presentations and discussions of the material in this thesis were made to the following:

American College of Radiology Efficacy Committee (approx. 30 people) April 2, 1972.
Mt. Auburn Hospital Staff (approx. 150) March 1, 1972.
Peter Bent Brigham Hospital Staff (approx. 50) April 10, 1972.
Western Michigan Radiological Society (approx. 60) February 19, 1972.
APPENDIX

OUTLINE OF THE SYSTEM
OUTLINE OF THE SYSTEM

A1 - Patient Visit
   Implications
   (1) A1 - A2
   (2) A1 - A3

A2 - Improper Medical Treatment

A3 - Proper Medical Treatment
   Implications
   (1) A2 - A
   (2) A3 - A

A - Perceived Negative Medical Experience
   Implications
   (1) A - A5
   (2) A - A6

A4 - Non-lawyer Advice
   Implications
   (1) A4 - A
   (2) A4 - A8

A5 - Economic Motivation of Patient
   Implications
   (1) A5 - A8
   (2) A5 - B

A6 - Non-Economic Motivation of the Patient
   Implications
   (1) A6 - A8
   (2) A6 - B

A7 - After Billing
   Implications
   (1) A7 - A8
   (2) A7 - G

A8 - Legal Action Considered
   Implications
   A8 - A9

A9 - Patients who Seek Legal Advice
   Implications
   A9 - B
A10 - Non-Access to Patients' Medical Records
   Implications
   A10 - B

A11 - Increase in Education and Income of Patients
   Implications
   (1) A11 - A5
   (2) A11 - G

A12 - Population Increase
   Implications
   (1) A12 - A1
   (2) A12 - J1

A13 - Unavailability of Medical Advice
   Implications
   A13 - B

A14 - Contingent Fee
   (1) A14 - A9
   (2) A14 - B

B - Malpractice Claims Filed
   Implications
   (1) B - N
   (2) B - O

C - Defensive Acts
   Implications
   (1) C - D
   (2) C - E
   (3) C - A13

D - X-rays Ordered
   Implications
   (1) D - F
   (2) D - I
   (3) D - X

E - Malpractice Insurance Coverage
   Implications
   (1) E - F
   (2) E - J
   (3) E - M

F - Cost of Health Care
   Implications
   F - G
G - Patient Rapport
   Implications
   (1) G - A
   (2) G - A8

H - Growth of Medical Knowledge
   Implications
   (1) H - A12
   (2) H - P
   (3) H - F
   (4) H - U
   (5) H - T
   (6) H - I
   (7) H - L
   (8) H - N1 - A

I - Legal Standards of Care
   Implications
   (1) I - J
   (2) I - N

J - Lawyers' Interest in Malpractice
   Implications
   (1) J - B
   (2) J - K

J1 Number of Lawyers
   Implications
   (1) J1 - A9
   (2) J1 - J

K - Patients' Legal Awareness
   Implications
   K - A9

L - Patients' Medical Awareness
   Implications
   (1) L - W
   (2) L - B
   (3) L - A

M - Patients' Insurance Awareness
   Implications
   M - B

N - Successful Claims

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N1 - The Media
  Implications
  (1) N - I
  (2) N - N1 - J
  (3) N - N1 - K
  (4) N - N1 - L
  (5) N - N1 - M
  (6) N - N1 - O

O - Physicians' Awareness of Threat
  Implications
  O - C

P - Increased Medical Specialization
  Implications
  P - G

Q - Decreased Dedication to Work (by everyone)
  Implications
  (1) Q - A
  (2) Q - G
  (3) Q - P

R - Government Health Insurance
  Implications
  (1) R - A5
  (2) R - A7
  (3) R - F
  (4) R - G
  (5) R - W

S - Diagnostic Efficacy
  Implications
  S - D

T - New Procedures (Innovation, Curiosity, Habit)
  Implications
  (1) T - D
  (2) T - S

U - Availability of Diagnostic Procedures
  Implications
  U - D

V - Trend for No-fault Insurance
  Implications
  V - J
W - Research Funding
   Implications
   (1) W - P
   (2) W - H
   (3) W - U

X - Medical Standards of Care
   Implications
   X - Y

Y - Peer Review
   Implications
   Y - O